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Article Number

#### **Indoor Residential Fate Model of Phthalate Plasticizers**

Yirui Liang, Ying Xu

University of Texas at Austin, Austin TX, United States

Keywords: three-compartment model, phthalates, sorption, particle transport, dust

#### **Modeling Thermal Plumes Under Mixed Convection Regimes**

Pierre-Sandre Farrugia, Alfred Micallef

University of Malta, Msida, Malta

Keywords: Turbulent plumes, mixed convection, point heat source, Computational fluid dynamics

### Environmental Factors, Symptoms and Working Conditions - A Comparison Between Small, Medium And Large Offices (SBiB-study)

Christian Th Monn, Margot Vanis

State Secretariat for Economic Affairs SECO, Work and Health, Zürich, Switzerland

Keywords: Questionnaire, Ventilation, Absence, Work Performance

#### Analysis of the influence of ventilation rate on sleep pattern

Jelle Laverge, Arnold Janssens

Ghent University, Ghent, Belgium

Keywords: sleep, ventilation rate, actigraphy, field study, questionnaire

#### Persistence of Pesticides in Residential Indoor Air and Chair Seat Foam

David E. Camann, Michelle M. Zuniga, Alice Y. Yau, Lynne P. Heilbrun, Tatjana T. Walker, Claudia S. Miller

Southwest Research Institute, San Antonio TX, United States

Keywords: Pesticides, Residential, Filtration

#### Life Cycle Valuation Of Ozone Gas-phase Filters

W. Brad M. Stanley, Bryan K. Ligman, M. Aflal Rahmathullah, Nathaniel J. Nance

AAF International, Doraville GA, United States

Keywords: Ozone Filtration, Gas-Phase Filters, Life Cycle Cost

# Comparative Spore Trap Study Reveals Poor Analytical Precision and The Need To Change Current Industry Methods And Practice

Larry D. Robertson

Robertson Consulting Group, LLC, Jewett TX, United States

Keywords: Accredited Laboratory, Indoor Air Quality, Total Fungal Bioaerosol, Airborne Fungal

Assessment

### Indoor Environment Quality and Energy Retrofits In Low-income Apartments: Retrofit Selection Protocol

Federico Noris, Brett C. Singer, William J. Fisk

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United States

Keywords: healthy affordable housing, multifamily energy savings, indoor air quality (IAQ) and comfort, rehabilitation benefits, efficiency intervention

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#### Chemical Release from Products and Materials: Innovations to Simplify Chemical Emission

#### **Testing For Industry**

Caroline S. Widdowson

Markes International, Llantrisant, United Kingdom

Keywords: Material emissions, VOC, microchambers, check standard

#### Chemical and particle efficiency of a portable photocatalytic air cleaner

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GDF SUEZ, La Plaine Saint Denis, France

Keywords: photocatalysis, air cleaner, efficiency evaluation method, secondary pollutants

#### Passive Air Cleaning With Green Building Materials: Ozone Removal and Aldehyde Yields

Seth P. Lamble, Glenn Morrison, Richard Corsi

Missouri University of Science & Technology, Rolla MO, United States

Keywords: Ozone, Passive Air Cleaning, Aldehydes, USGBC, LEED Certification

# Comparison between octanol and a generic organic as a surrogate for particulate organic matter when modeling SVOCs gas/particle partitioning

Cong Liu, Yinping Zhang

Tsinghua University, Beijing, China

Keywords: Absorption, Aerosol, Settled dust, SPARC, Indoor air quality

#### Past and future risk information seeking: The case of radon and poor IAQ

Sonny Rosenthal

The University of Texas at Austin, Austin TX, United States

Keywords: risk communication, health communication, outreach, structural model, path analysis

#### **Building a Scale to Measure Indoor Environmental Knowledge**

Sonny Rosenthal

The University of Texas at Austin, Austin TX, United States

Keywords: scale development, science literacy, risk psychology, factor analysis, survey methodology

#### **Health Complaints and Environmental Glass Fiber**

Ernest R. Crutcher

Microlab Northwest, Redmond WA, United States

Keywords: Sick Building Syndrome, Glass Fiber Identification, Tapelifts, Control of Variance

#### **Experimental Study of Particle Resuspension from Indoor Surfaces**

Siming You, Man Pun Wan

Nanyang Technological University, School of Mechanical and Aerospace Engineering, Singapore, Singapore

Article Number

Keywords: Resuspension, IAQ, Surface material, Surface orientation

#### Air And Wipe Sampling For Pthalates In A Medical Office Building

Erica J. Stewart

Kaiser Permanente, National Environmental, Health & Safety, Oakland CA, United States

Keywords: health care, endocrine disruptors, field studies

#### Impact of operating wood-burning stoves on indoor air quality Quality

Alireza Afshari, Ole Micheal Jensen, Niels C. Bergsøe, Ricardo Luis Teles de Carvalho Danish Building Research institute, Aalborg University, Department of Energy and Environment, Hoersholm, Denmark

Keywords: Wood-burning, stoves, ultrafine particles, ignitio, operation

#### Method for determining convective mass transfer correlations for indoor surfaces

Jordan Clark, Atila Novoselac

University of Texas at Austin, Civil, Architectural and Environmental Engineering Department/IGERT, Austin TX, United States

Keywords: modeling, convective mass transfer, passive pollutant removal

### Methamphetamine Accumulation in Paint Films: Estimation of Model Parameters and Residential Exposure

Shi Shu, Meng Ke, Richard Corsi, Glenn Morrison

Missouri S&T, Rolla MO, United States

Keywords: Methamphetamine, building materials, diffusion, partition coefficient, latex paint

#### Climate Change and Potential Effects on Microbial IAQ With a Focus on Air-Conditioning

Philip R. Morey,

ENVIRON International Corp., Gettysburg PA, United States

Keywords: Severe Weather Events, Legionella, Pathogens, Mold, HVAC Maintenance

#### **Predicting Cross Ventilation Flow Rate using Wind Tunnel Decay Test**

Liangchung J. Lo, Atila Novoselac, David Banks

University of Texas at Austin, Austin TX, United States

Keywords: Natural Ventilation, Energy Efficient Buildings

#### Seasonal variation in indoor air quality from a field study investigating the impact of

#### ventilation rates on the health of asthmatic children in Quebec City

Daniel Aubin, Doyun Won, Denis Gauvin, Don Fulger, Pierre Lajoie, Hans Schleibinger National Research Council of Canada, Ottawa ON, Canada

Keywords: indoor air quality, field study, air exchange rate, seasonal variation, intervention

### Quantification Of Air Convection For Highly Insulated And Airtight Houses Based On Whole-

room Heating In Japan

Koki Kikuta, Hirofumi Hayama, Masamichi Enai Hokkaido University, Sapporo, Japan

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Keywords: Air convection, Superposition, Interzonal airflows,

#### Low-energy Buildings In Europe - Standards And Their Consequences On Indoor Climate

Katharina Thullner, Dennis Johansson, Ulla Jansson

Swegon AB/Lund University, Research and Development, Building Services, Tomelilla, Sweden

Keywords: Low energy housing, Passive house, Indoor climate, Standards, Europe

#### **Evaluation of Soil-Gas Sampling Rate**

Bart Eklund

URS Corporation, Austin TX, United States

Keywords: soil gas, vapor intrusion, sampling rate,

#### Awareness Of The Risk From Carbon Monoxide Among Tenants Of English Public Housing

Veronique Ezratty, David Ormandy, Serge Koscielny

WHO Collaborating Centre for Housing Standards and Health, Medical Studies Department, EDF, Levallois-Perret, France

Keywords: Public Communication, Influencing Behaviour, Carbon Monoxide,

### Effectiveness Of Campaigns In Raising Awareness Of The Risk From Carbon Monoxide In A United Kingdom Student Population

David Ormandy, Veronique Ezratty, Serge Koscielny

WHO Collaborating Centre for Housing Standards and Health, Institute of Health, Coventry, United Kingdom

Keywords: Public Communication, Influencing Behaviour, Carbon Monoxide,

#### Characterizing Gas-particle Interactions Of Phthalate Plasticizer Emitted From Vinyl Flooring

Jennifer L. Benning, Zhe Liu, Andrea Tiwari, John Little, Linsey Marr

South Dakota School of Mines and Technology, Rapid City SD, United States

Keywords: Indoor air quality, SVOC, emissions, phthalates, partitioning coefficient

#### Assessment of Indoor and Outdoor Air Pollution in a Residential High-Rise

Gary Mallach, Ryan Kulka, Russell Dietz, Lance Wallace, Halûk Özkaynak, Ron Williams, Amanda Wheeler, Marie-Ève Heroux, Markey Johnson

Water, Air and Climate Change Bureau, Health Canada, Ottawa ON, Canada

Keywords: Particulate Matter, Volatile Organic Compounds, Air Exchange/Infiltration, High-Rise Apartment Building, Vertical Distribution

### Investigating The Exposure Of Military Personnel Serving In The Middle East To Ambient

Particulate Matter Josh Aldred, Rich Corsi

U S Air Force Academy, U S Air Force Academy CO, United States

Keywords: Ambient Air Pollution, Military Exposure, Monte Carlo Simulation, Indoor Air

#### Passive Removal Of Indoor Ozone By Green Building Materials

Clement Cros, Glenn C. Morrison, Jeffrey A. Siegel, Richard L. Corsi

Article Number

The University of Texas at Austin, Austin TX, United States

Keywords: Passive Removal Materials, Primary emissions, Secondary emissions, Ozone

deposition velocity

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Iris Schweinfurth, Sabine Brasche, Runa T. Hellwig, Wolfgang Bischof, Beate Popfinger,

Hansjürgen Gebhardt, Inna Levchuk, Kersten Bux

Fraunhofer Institute for building physics, Valley, Germany

Keywords: physiological measurements, heat stress, high temperatures, laboratory study, office

work

# Phthalates Metabolite Levels as Effective Predictors for Childhood Allergic Responses and Reporting Respiratory Symptoms

Nai-Yun Hsu, Ching-Chang Lee, Yi-Cheng Li, Hsin-Wen Chang, Jiu-Yao Wang, Chung-Yu Chen, Carl-Gustaf Bornehag, Pei Chih Wu, Jan Sundell, Huey Jen Su

College of Medicine, National Cheng Kung University, Department of Environmental and Occupational Health, Tainan, Taiwan

Keywords: phthalate, mono-benzyl phthalate (MBzP), bioaerosols, respiratory symptom, allergy

#### New Protocol For The Assessment And Remediation Of Indoor Mold Growth

Ed Light

Building Dynamics, LLC, Ashton MD, United States

Keywords: building investigation, restoration, moisture, bioaerosols, fungi

#### Measuring the Corrosivity of Indoor Air

Ed Light, Brian Little, Michael Barclay, Barbara Manis, James Bailey, Roger Gay

Building Dynamics, LLC, Ashton MD, United States

Keywords: corrosive drywall, sampling and analytical, odor, irritation, residential

### Predicting Inhalation Exposure To Cleaning Products: Comparing A New Two-compartment Model To A Well-mixed Model.

C. Matt Earnest, Richard L. Corsi

University of Texas at Austin, Austin TX, United States

Keywords: Volatile Organic Compounds, Thermal Plume, Emission,

#### **Emission Rates Of Volatile Organic Compounds In New Homes**

Bud Offermann, Al Hodgson

Indoor Environmental Engineering, San Francisco CA, United States

Keywords: formaldehyde, contaminant exposures, ventilation rates, ASHRAE Standard 62.2, residences

#### **Evaluation Of The Biocide Concentration Levels During And Post-application Of Electric**

Vaporizers Using A Proton-transfer-reaction Mass Spectrometer Device

Aude Vesin, Etienne Quivet, Brice Temime-Roussel, Henri Wortham

Article Number

Laboratoire Chimie Provence - Equipe Intrumentation et Réactivité Atmosphérique, Marseille Cedex 3, France

Keywords: household pesticides, on-line monitoring, concentration profiles, peak concentration, residential

### Temporally- And Chemically-resolved On-line Monitoring Of Biocide Aerosols After Insecticide Spray Application

Aude Vesin, Etienne Quivet, Brice Temime-Roussel, Henri Wortham

Laboratoire Chimie Provence - Equipe Intrumentation et Réactivité Atmosphérique, Marseille Cedex 3, France

Keywords: household pesticides, aerosol mass spectrometer, concentration profile, peak concentration, residential

#### **Comparison Of Metrics For Characterizing The Quality Of Indoor Air**

Mark C. Jackson, Randall L. Penn, Josh R. Aldred, Harold I. Zeliger, Gary E. Cude, Linda M. Neace, James F. Kuhs, Richard L. Corsi

University of Texas at Austin, and Lennox International Inc., Carrollton TX, United States Keywords: Database, VOCs, Aldehydes,

#### Fragranced Consumer Products: Chemicals Emitted, Ingredients Unlisted

Anne Steinemann, Ian C. MacGregor, Sydney M. Gordon, Lisa G. Gallagher, Amy L. Davis, Daniel S. Ribeiro, Lance A. Wallace

University of Washington, Civil and Environmental Engineering, and Public Affairs, Seattle WA, United States

Keywords: VOCs, Fragrance, Consumer Products, Ingredients, Green

#### Simplifying the Geometry of an Airliner Cabin for CFD Simulations

Wei Liu, Chao-Hsin Lin, Junjie Liu, Qingyan Chen

TJU, Tianjin, China

Keywords: Air distribution, simplification, CFD,

# Car Cabin Air Quality : Application Of The Field Of Odors® Approach For The Odor Evaluation Of Car Components

Marie Verriele, Hervé Plaisance, Jean Noël Jaubert, Virginie Vandenbilcke, Nadine Locoge, Guillaume Meunier

Ecole des Mines de Douai, Chimie et Environnement, Douai, France

Keywords: sensorial analysis, conventional profile, car-part-olfactory discrimination, hierarchical clustering analysis

#### Architectural Design Solutions To Indoor Air Related Diseases In The Urban Areas In Ghana

Victor K. Quagraine, Jeannette Attipoe

Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, Architecture, Kumasi, Ghana

Keywords: Cross-ventilation, Building orientation, Prevailing winds, Indoor air pollutants, Related diseases

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#### Mercury Air Concentrations and Sources in Minnesota (U.S.A.) Schools

Carol Hubbard, Daniel C. Tranter

Minnesota Department of Health, St. Paul MN, United States

Keywords: building assessment, children, contamination,

#### **Fungal Growth Sequence On Gypsum Wall Board Assemblies**

Ralph E. Moon, Michael Bass, Chin Yang

HSA Engineers & Scientists, Building Sciences Department, Tampa FL, United States

Keywords: Residential, Laboratory Studies, Biological,

#### Impacts Of Passive Removal Materials On Indoor Air Quality

Erin K. Darling, Clement Cros, Pawel Wargocki, Jakub Kolarik, Adam Targowski, Glenn Morrison, Richard L. Corsi

The University of Texas at Austin, Civil, Architectural, and Environmental Engineering, Austin TX, United States

Keywords: perceived air quality, clay, ozone removal, aldehydes

#### **Comparison Of Air Exchange Rates Measured With Different Methods And Influencing Factors:**

#### Preliminary Results Of A Field Study Involving Asthmatic Children

Doyun Won, Daniel Aubin, Don Fugler, Denis Gauvin, Pierre Lajoie, Hans Schleibinger National Research Council Canada, Ottawa ON, Canada

Keywords: Ventilation, Asthma, Resident, Perfluorocarbon tracer gas, Sulphur hexafluoride

#### **Characterizing Commercially Available Formaldehyde Sensors**

Doyun Won, Gang Nong, Wenping Yang, Hans Schleibinger

National Research Council Canada, Ottawa ON, Canada

Keywords: Indoor air, linearity, selectivity, cross-sensitivity, environmental variables

#### Re-suspension Of Indoor Particles Due To The Activity Of Domestic Dogs

Josh Aldred, Rich Corsi

U S Air Force Academy, U S Air Force Academy CO, United States

Keywords: Domestic Pets, Particle Re-Suspension, Indoor Air Quality,

### Activation of Nociceptive Transient Receptor Potential Channels by Phosphate Ester Flame Retardants/Plasticizers

Hideto Jinno, Susumu Ohkawara, Yoko Furukawa, Tetsuji Nishimura, Toshiko Tanaka-Kagawa National Institute of Health Sciences, Division of Environmental Chemistry, Setagaya-ku, Japan Keywords: indoor air pollutants, sick-building syndrome, airway chemosensation, irritation

#### **New Calculation Method for Energy Consumption of Air Handling Units**

László Kajtár, Miklós Kassai, József Gräff, Szabó János

Budapest University of Technology and Economics, Building Service Engineering and Process Engineering, Budapest, Hungary

Keywords: energy consumption, air handling unit, calculation method, energetic analysis

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#### On The Numerical Accuracy Of Particle Dispersion Simulation In Operating Theatres

Wiebe Zoon, Marcel loomans, Jan Hensen

Eindhoven university, Building physics and systems, Eindhoven, Netherlands

Keywords: operating room, cfd, turbulence modelling,

#### **Tracing Contaminant Source Location Inside an Enclosed Environment**

Arash Bastani, Fariborz Haghighat, Janusz Kozinski Concordia University, Montreal QC, Canada

Keywords: CBA, ANN, Contaminant source identification,

#### The Challenge Of Simultaneously Achieving Green And Healthy Buildings

Charlene W. Bayer

Georgia Institute of Technology, Georgia Tech Research Institute, Atlanta GA, United States Keywords: healthy buildings, green buildings, indoor environment, health, productivity

#### Investigation Of Chronic Airborne Infection At an Air Traffic Control Facility

Robert G. Baker, Joseph Lstiburek, Daniel Greenblatt

BBJ Environmental Solutions, Riverview FL, United States

Keywords: Mould Investigation, IAQ, Sick Building, Mould Health Effects, Building Moisture

**Problems** 

#### Study Design of the Healthy Zero Energy Buildings (HZEB) Program In California

Michael G. Apte, Mark J. Mendell, Wanyu R. Chan, Henry Willem

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United

States

Keywords: Ventilation rate standards, Commercial buildings, Human outcomes, Energy efficiency

#### Formaldehyde: How Low Can We Go?

Mark C. Jackson, Jim Kuhs, Randall L. Penn, Gary E. Cude, Linda M. Neace

Lennox International Inc. and University of Texas at Austin, Indoor Air Quality Platform,

Carrollton TX, United States

Keywords: Formaldehyhde, Field Trial

#### BREATH ANALYSIS, PUPILLOGRAPHY AND HEART RATE VARIABILITY

William J. Rea, Yagin Pan, Vatsalya Shukla

Environmental Health Center of Dallas, Dallas TX, United States

Keywords: Breath Analysis, Pupillography, Heart-Rate Variability,

#### Capturing Particulate And Gas-phase Oxidation Products Of Indoor Chemistry

Ray Wells

NIOSH, Morgantown WV, United States

Keywords: carboxylic acids, carbonyl compounds, ozone, terpenes, sampling

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#### Differences Between Passive And Active Cooling Systems In Gender, Physiological Responses,

#### **Thermal Sensation And Productivity**

Lisje Schellen, Marcel Loomans, Wouter Van Marken Lichtenbelt, Martin de Wit, Jørn Toftum

Eindhoven University of Technology, Eindhoven, Netherlands

Keywords: Thermal comfort, Physiological responses, Thermo Physiological Test Room,

Productivity, Non-uniform environmental conditions

#### Underlying Mechanisms Behind Ocular Discomfort In Offices: Is Ozone The Answer?

Peder Wolkoff

NRCWE, Copenhagen Ø, Denmark

Keywords: Chemesthesis, Eyes, Ozone, precorneal tear film, Thermal climate

#### A Method For Measuring Ozone Penetration Through The Building Envelope

Brent Stephens, Elliott T. Gall, Jeffrey A. Siegel

The University of Texas at Austin, Civil, Architectural and Environmental Engineering, Austin TX, United States

Keywords: infiltration, residential buildings, ozone exposure, pollutant penetration factor

#### **Numerical And Experimental Study Of Airflow Associated With Coughing**

Shichao Liu, Atila Novoselac

The University of Texas at Austin, Austin TX, United States

Keywords: Coughing, CFD, Exposure,

### A Preliminary Investigation Of Indoor Formaldehyde Concentrations In Military Southwest Asia Huts (SWAHuts)

Josh Aldred

U S Air Force Academy, U S Air Force Academy CO, United States

Keywords: formaldehyde, plywood, SWAHuts, Monte Carlo Simulation, Indoor Air

### Design Method for Indoor Spaces with Under-Floor

#### **Air Distribution Systems**

Guangqing Xue, Kisup Lee, Qingyan (Yan) Chen

School of Mechanical Engineering, Purdue University, West Lafayette IN, United States

Keywords: Under-floor air distribution, Thermal comfort, Ventilation design,

#### Users Have Problems With Occupant Controls: A Need For Improved Usability

Sami Karjalainen

VTT Technical Research Centre of Finland, Espoo, Finland

Keywords: occupant control, personal control, occupant behavior, usability, user interfaces

### PVC flooring and its relation to human uptake of phthalates in infants. A pilot study to the SELMA-study pilot.

Fredrik Carlstedt, Mikael Hasselgren, Carl-Gustaf Bornehag, Bo A. Jonsson, Malin Larsson

Karlstad University, Public Health Science, KARLSTAD, Sweden

Keywords: Endocrine disruptors, Epidemiology

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#### Respiratory toxicity of chemical mixtures: predicting low level responses

Harold I. Zeliger

Zeliger Research and Consulting, West Charlton NY, United States

Keywords: Predicting respiratory toxicity, Toxic chemical mixtures, Toxic respiratory mixtures,

Respiratory toxins, Toxic respiratory chemicals

### Exhaled levels of nitric oxide in infants are related to housing factors. A SELMA-study pilot.

Fredrik Carlstedt, Anna-Carin Olin, Carl-Gustaf Bornehag, Mikael Hasselgren Primary Care Research Centre, KARLSTAD, Sweden Keywords: Asthma, Moisture/dampness, Epidemiology,

#### Validation Of A Fast-Fluid-Dynamics Model For Predicting Particle Distribution

Wangda Zuo, Chen Qingyan

Lawrence Berkeley National Laboratory, Berkeley CA, United States

Keywords: FFD, CFD, Particle Transportation, Low Stokes Numb

### Characterizing Ventilation Rates In Classrooms And Their Effects On Ultrafine Particle Concentrations

Nasim A. Mullen, Seema Bhangar, William W. Nazaroff
University of California, Berkeley, Civil & Environmental Engineering, Berkeley CA, United States
Keywords: Air-exchange rate, Particle number concentration, Particle filtration, Exposure,
Children

#### A Pilot Study On The Effects Of Ventilation Rate On Creativity Performance

Jingjing Wang, Monica Burris, Alan Hedge, Tiffany Koszalka, Jianshun Zhang Syracuse University, Mechanical and Aerospace Engineering, Syracuse NY, United States Keywords: Creativity, Ventilation, Outdoor airflow rate, IEQ, Perceived air quality

### Effect Of An Air Purifying System Of An Air Conditioner Using An Electrostatic Precipitator For Removal Of Airborne Virus

Akari Hata, Satoshi Ohshiro, Kimiyasu Honda, Takemi Oketa, Akira Okaue Panasonic Corporation, Kusatsu City, Japan

Keywords: Air cleaning, Use/occupant control of indoor environment, Model,

#### **Concentration And Constitution Of Tvoc In Recent New Building**

Atsushi Mizukoshi, Noguchi Miyuki, Yamki Takako, Yanagisawa Yukio Tokyo Metropolitan Industrial Technology Research Institute, Kashiwa, Japan Keywords: TVOC

#### Indoor and Outdoor Air Concentrations of Perfluorinated Compounds in Singapore

Yaoxing Wu, Victor Chang Nanyang Technological University, Singapore, Singapore Keywords: PFC, FTOH, FOSA, air

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### Use Of Cavity Ringdown Spectroscopy (CRDS) To Deliver Nitrate Radicals For Indoor Surface

Jason E. Ham, Michael M. Flemmer

National Institute for Occupational Safety and Health, Morgantown WV, United States

Keywords: cavity ringdown spectroscopy, nitrate radicals, a-terpineol, indoor surface chemistry

#### **Nitrate Radical Kinetics And Products With Common Fragrance Compounds**

Joel C. Harrison, Jason Ham, J. R. Wells

NIOSH, Morgantown WV, United States

Keywords: kinetics, nitrate radical, terpenes, solvents, cleaners

# The Influence Of Relative Humidity And Gaseous Ammonia On The Sorption Of Nicotine Onto Carpet

Maneerat Ongwandee, Poramaporn Sawanyapanich

Mahasarakham University, Faculty of Engineering, Mahasarakham, Thailand

Keywords: adsorption, nicotine, ammonia,

#### Sources And Concentrations Of Volatile Organic Compounds In Bangkok Office Buildings

Maneerat Ongwandee, Rathakheth Moonrinta, Sirima Panyametheekul, Chalongkwan

Tangbanluekal, Glenn Morrison

Mahasarakham University, Mahasarakham, Thailand

Keywords: volatile organic compound, ventilation, emission rate,

#### **Experimental Study Of Various Air Distribution Systems On Commercial Airplanes**

Tengfei (Tim) Zhang, Penghui Li, Shugang Wang

Dalian University of Technology, Dalian, China

Keywords: Aircraft cabin, Air distribution, Personal ventilation, Under-aisle air supply, Experiment

#### Indoor-outdoor Ultrafine Particles In 50 Homes In Edmonton, Canada

Lance Wallace, Amanda Wheeler, Jill Kearney, Keith Van Ryswyk, Fay Li, Warren Kindzierski,

Marie-Ève Héroux

Consultant, Reston VA, United States

Keywords: particles, ultrafine particles, deposition,

#### Primary And Secondary Emissions From Green Building Materials: Large Chamber Experiments

Elliott T. Gall, Erin T. Darling, Seth Lamble, Glenn Morrison, Richard Corsi

University of Texas, Austin TX, United States

Keywords: Sources/emissions, Oxidation products, Green and sustainable chemistry,

#### **Determination Of Ozone Reaction Probabilities With Porous Materials**

Elliott T. Gall, Richard Corsi, Jeffrey Siegel

University of Texas, Austin TX, United States

Keywords: Ozone transport and reaction, Fluid mechanics

Article Number

#### Indoor PM2.5 and CO concentrations and variations in typical Tibetan tents, China

Chaoliu Li, Pengfei Chen, Shichang Kang, Qianggong Zhang, Junming Guo Institute of Tibetan Plateau Research, Beijing, China

Keywords: indoor air pollution, PM2.5, carbon monoxide, the Tibetan Plateau, tent

#### Generation Of Fine Particles And Secondary Oxidation Compounds During Terpenes Ozonolysis

Miyuki Noguchi, Yusuke Ishizuka, Atsushi Mizukoshi, Yuka Sakai, Akihiro Yamasaki, Yukio Yanagisawa

The University of Tokyo, Chiba, Japan

Keywords: a-pinene, limonene, coexistent acetaldehyde, PTR-MS, SMPS

#### Study Of Indoor Formaldehyde Emission By Lycium

Meng-Chieh J. Lee, Hsin-Chun Chen, Liang-Hsuan Huang, Ling Tim Wong, Kwok-Wai Mui National Taichung Institute of Technology, Department of Interior Design, Taichung City, Taiwan Keywords: indoor, formaldehyde, Lycium, hyperchromic, additives

#### Indoor Air Pollution and Health - Estimate of the burden of disease in Ireland and Scotland

Amy L. Shafrir, Araceli Sánchez Jiménez, Fintan Hurley, Karen S. Galea, Hilary Cowie, Sean Semple, Marie A. Coggins, Jon Ayres

Scottish Centre for Indoor Air, Institute of Occupational Medicine (IOM), Edinburgh, United Kingdom

Keywords: Indoor Air, Health impact assessment, Biomass combustion, Environmental tobacco smoke

### Repeated Exposure To Ozone-initiated Limonene Products In Balb/c Mice: No Alveolar And Inflammatory Effects

Peder Wolkoff, Ken Wilkins, Per Axel Clausen, Søren Thor Larsen, Maria Hammer, Gunnar D. Nielsen

NRCWE, Copenhagen Ø, Denmark

Keywords: In vivo testing, Ozone-initiated reactions, Sensory irritation, Upper and lower airway effects

#### Defining The Pressure Drop Increase For The Filters Of The Balanced Ventilation Systems

Alain Ginestet, Laure Mouradian, Dominique Pugnet

CETIAT, Villeurbanne, France

Keywords: Filtration, Particles, Ventilation, Field studies

### Paint Volatile Organic Compound Emissions And Volatile Organic Compound Content Comparison Study

Stephany I. Mason, Arthur Ceragioli

Air Quality Sciences, Inc., Marietta GA, United States

Keywords: VOCs, indoor air quality, green and sustainable buildings, laboratory studies,

standards, guidelines, code

#### Implications Of Error Rates Associated With Numerical Criteria For Airborne Fungal Data

R. Christopher Spicer, Harry J. Gangloff

Article Number

WCD Consultants, Pennington NJ, United States

Keywords: Bootstrap, Detection frequency, Simulation, Statistical significance

#### A comparative study of kerosene space heaters gaseous pollutant emissions

Marion Carteret, Benjamin Hanoune, Jean-François Pauwels

PC2A, Villeneuve d'Ascq, France

Keywords: Chamber study, NOx, VOC, emission factors, parameters influencing emissions

#### Modeling Indoor Particle Contaminant Transportation With Advanced Airflow Models

Miao Wang, Qingyan Chen, Mingang Jin

Purdue University, West Lafayette IN, United States

Keywords: Particle, Computational Fluid Dynamics, Turbulence Model, Lagrangian Method,

**Eulerian Method** 

### Lowering Gas-phase Concentration Of Formaldehyde In Indoor Environment By A New Amino Silane Based Coating.

Gourish Sirdeshpande, Kenneth Caldwell, Michael Cook

Armstrong World Industries Inc., Lancaster PA, United States

Keywords: VOC reduction, Aldehyde, Building Materials, Measurement and modelling, Finishing

and coatings

### An Indoor Air Quality Monitoring Protocol Of Air-conditioned Offices - A Review Of Hong Kong Experience

Kwok-Wai MUI, Ling-Tim WONG, Pui-Shan HUI

The Hong Kong Polytechnic University, Hong Kong, Hong Kong

Keywords: Indoor air quality, Assessment schemes, Epistemic,

# Comparisons between experiments and CFD predictions for deposition performance with 1 µm aerosols, *Staphylococcus* and *Micrococcus* in a forced ventilated chamber

WONG Ling-Tim, Kwok-wai MUI, LAI Chi-Keung, CHAN Wai-Yee, Zhou Longjie

The Hong Kong Polytechnic University, Building Services Engg.,, Hong Kong, Hong Kong

Keywords: bioaerosols, deposition, Eulerian-Lagrangian computations, test chamber, ventilation

#### Study On Formaldehyde And Voc Emissions From Different Manufacturing Stages Of Woodbased Panels

Zhongkai He, Wenjuan Wei, Yinping Zhang

Department of Building Science, Tsinghua University, Beijng, China

Keywords: Volatile organic compounds, Wood-based panel, Formaldehyde, Urea-formaldehyde

resin, Phenol-formaldehyde resin

#### Individualisation of Virtual Thermal Manikin Models for Predicting Thermophysical Responses

Daniel Wölki, Christoph van Treeck, Yi Zhang, Sebatian Stratbücker, Sandeep Rao Bolineni, Andreas Holm

Fraunhofer Institute for Building Physics IBP, Valley, Germany

Keywords: Models, Human subjects, Comfort, Thermal

Article Number

#### Development of indoor dust guidelines: DEHP case study

Boulanger Guillaume, Marion Keirsbulck, Hafid Belhadj-Tahar, Myriam Blanchard, Pierre-André Cabanes, Denis Caillaud, Brigitte Enriquez, Ghislaine Goupil, Frédérique Grimaldi, Gaëlle Guillossou, Juliette Larbre, Nathalie Leclerc, Maurice Millet, Luc Mosqueron, Corinne Schadkowski, Ludovic Tuduri, Corinne Mandin Anses (French Agency for Food, Environmental and Occupational Health Safety), maisons alfort, France

Keywords: SVOCs, guidelines, dust, DEHP

#### Hydroxyl Radical Yields From Reactions Of Ozone With Terpene Mixtures

Crystal D. Forester, J. R. Wells

National Institution for Occupational Safety and Health, Morgantown WV, United States

Keywords: Commercial cleaning product, OH, gas-phase chemistry, SPME

#### **Respiratory Effects Of Some Key Ozone-initiated Terpene Reaction Products**

Peder Wolkoff, Søren Thor Larsen, Maria Hammer, Vivi Kofoed-Sørensen, Per Axel Clausen, Gunnar D. Nielsen

NRCWE, Copenhagen Ø, Denmark

Keywords: In vivo testing, Ozone-initiated reactions, Upper and lower airway effects,

#### A Study on Human Perceptible Fluctuation of Dynamic Airflow

Li Huang, Yingxin Zhu, Qin Ouyang

Department of Building Science, School of Architecture, Tsinghua University, Building Science, Beijing, China

Keywords: Laboratory studies, Thermal comfort, Dynamic airflow, Fluctuation frequency

#### Effects on perceived air quality of a photocatalytic cement-based paint tested under steadystate and transient conditions

Jakub Kolarik, Jørn Toftum

International Centre for Indoor Environment and Energy, Kgs. Lyngby, Denmark

Keywords: PCO, human bioeffluents, building materials,

#### **Experimental Measurement Of Thermofulid Boundary Conditions In Commercial Aircraft**

Xuan Mu, Jizhou Wen, Wei Liu, Zheng Gong, Chao-Hsin Lin, Junjie Liu, Qingyan Chen School of Environmental Science and Technology, Tianjin, China

Keywords: Ventilation rate, Velocity, Temperature, Boundary conditions

### Can gaspers provide protection from airborne contaminants to the occupants in an airliner cabin?

Jitendra K. Gupta, Chao-Hsin Lin, Qingyan Chen

Purdue University, Mechanical Engineering, West lafayette IN, United States

Keywords: Personal Ventilation, Risk, CFD, Airborne Infection

#### Measurements of Volatile Organic Compounds (VOCs) in an Airliner Cabin

Lei Meng, Junjie Liu, Qingyan Chen

Article Number

Tianjin University, Tianjin, China

Keywords: VOCs, TVOC, airliner cabin, ventilation, health

#### Use And Misuse Of Indoor Air Guideline And Reference Values

Tunga Salthammer

Fraunhofer WKI, Braunschweig, Germany

Keywords: guidelines, referene values, regulations, statistical criteria, health-related criteria

### Human-centred Indoor Thermal Performance Analysis by Scale-adaptive Coupling of Heterogeneous Computational Codes

Christoph van Treeck, Sebastian Stratbücker, Sandeep Rao Bolineni, Daniel Wölki, Andreas Holm Fraunhofer-Institute for Building Physics, Indoor Environment, Valley, Germany Keywords: Thermal comfort, Co-simulation middleware, Virtual physiological manikin, Model coupling, Human thermoregulation

### Geographical And Seasonal Variation Of Fungal And Bacterial Components In Mattress Dust Across Europe

Maria Valkonen, Martin Täubel, Anne Hyvärinen, Debbie Jarvis, Joachim Heinrich, Chih-Mei Chen, Jan-Paul Zock, Aino Nevalainen, Juha Pekkanen, Helena Rintala National Institute for Health and Welfare, Kuopio, Finland Keywords: Methods, qPCR, microbes, mattress dust

#### SVOC exposure indoors: Fresh look at dermal pathways

Charles J. Weschler, William W. Nazaroff

University of Medicine and Dentistry of NJ, Evironmental and Occupational Medicine, Piscataway NJ, United States

Keywords: air-to-skin, skin surface lipids, partitioning, handwipes, permeability coefficients

#### Staying Healthy In A Water-damaged Building. The Surface Emissions Trap.

Lennart Larsson, Pawel Markowicz

Lund University, Dept of laboratory medicine, Lund, Sweden

Keywords: Volatile organic compounds, microorganisms, water-damaged buildings, absorption and adsorption

### Size-Fractionated Emissions and Microbial Population Characterization to Reveal Sources of Bacteria in Indoor Air

Denina Hospodsky, Jing Qian, Naomichi Yamamoto, William W. Nazaroff, Jordan Peccia Yale University, New Haven CT, United States

Keywords: bioaerosol sources, qPCR, next generation DNA sequencing, resuspension, phylogenetic analysis

### Seasonal Source Emission Rates of Bacterial Aerosols in Naturally Ventilated Buildings in Lanzhou, China

Denina Hospodsky, Dana Miller, Sisira Gorthala, Jordan Peccia Yale University, New Haven CT, United States

Article Number

Keywords: Bioaerosol size Distribution, Less developed countries, qPCR, Respiratory infections, Seasonal variation

#### Numerical Investigation Of Airborne Transmission Of Influenza In A Bus Microenvironment

Shengwei Zhu, Jelena Srebric, John D. Spengler, Philip Demokritou

Harvard School of Public Health, Environmental Health, Boston MA, United States

Keywords: Bus Microenvironment, CFD, Wells-Riley Equation, Airborne Transmission, Mixing Ventilation

#### Benefits And Costs Of Increasing Ventilation Rates In U.S. Offices

William J. Fisk, Gregory Brunner, Black Doug

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United States

Keywords: cost-benefit analysis, economizers, health, office ventilation rates, work performance

### Impact Of Human Activity On Unsteadiness Of Airflow And Convective Heat Transfer In Indoor Environmental Studies

Leen Peeters, Atila Novoselac

University of Brussels (VUB), Etterbeek, Belgium

Keywords: air flow, human activity, heat transfer, transient flow, temperature field

#### p-Dichlorobenzene (p-DCB) and Naphthalene Adsorption to Clothing

Priscilla A. Guerrero, Richard L. Corsi

University of Texas at Austin, Civil, Architectural, and Environmental Engineering, Austin TX, United States

Keywords: volatile organic compound, moth repellents, materials, exposure

### Airborne particles dispersion from a source and removal performance of air cleaner and UVGI system in a waiting room of a hospital

Minki Sung, Shinsuke Kato, Jonghun Kim, U. Yanagi, Marina Asai,

Masayuki Sato, Naoki Kagi, Yoonkyung Kang, Hiroshi Ida

the University of Tokyo, Tokyo, Japan

Keywords: Hospital, airborne particles, air cleaner, UVGI

### **Experimental Investigation Of A Small-Scale Model Room Using A New Method Of Scaling Indoor Airflows**

Max Koerner, Andre Thess

Ilmenau University of Technology, Ilmenau, Germany

Keywords: measurement, physics, experimental scaling, mixed convection

#### Improved Ventilation And Temperature Control In A Nursery

**Piet Jacobs** 

TNO, Delft, Netherlands

Keywords: Intervention study, Nursery, Ventilation system, Low pressure design, Temperature zoning

Article Number

#### Indoor Volatile Organic Compounds (VOC) after Renovation

Olf Herbarth, Silke Matysik

University Leipzig, Faculty of Medicine, Environmental Medicine & Hygiene, Leipzig, Germany

Keywords: indoor exposure VOC, renovation, waiting period, hygiene

### The Effect Of Temperature On Work Performance And Thermal Comfort - Laboratory Experiment

Henna Häggblom, Valtteri Hongisto, Annu Haapakangas, Hannu Koskela

Finnish Institute of Occupational Health, Turku, Finland

Keywords: Office environment, Cognitive performance, Self-rated performance, Gender,

Motivation

#### **Health Hazards of Home Based Economic Activities In Residential Areas**

MAYANK MATHUR

SCHOOL OF PLANNING AND ARCHITECTURE, NEW DELHI, India

Keywords: Microenvironment, Home Based Economic Activity, Pollution, Workers with low

income, Spatial configuration

#### Do Ioniser Devices Provide Effective Control Of Airborne Microorganisms?

Louise A. Fletcher, Tim van der Graaf

University of Leeds, School of Civil Engineering, Leeds, United Kingdom

Keywords: bioaerosols, negative ions, positive ions, aerobiology, air disinfection

# Assessment of health and comfort in an indoor office environment: the need for another approach

Philomena M. Bluyssen

TNO, Built environment and Geosciences, Delft, Netherlands

Keywords: office environment, wellbeing, health and comfort, assessment, indicators

#### Condition Assessment Methodologies For Public School Indoor Environmental Health

Deborah Young-Corbett, Paul Ackerman

Virginia Tech, Blacksburg VA, United States

Keywords: lead, asbestos, public schools, optimization, condition assessment

### Comparisons Of Stationary And Personal Exposure Measurements Of Volatile Organic Compounds

Bo E. Glas

Department of Clinical Medicine and Public Health, Umeå, Sweden

Keywords: Chemical exposure measurements, Personal sampling, Stationary sampling,

Variability, VOC

#### Effect Of Microbial Exposure In The Development Of Asthma In Children

Tiina Reponen, Umesh Singh, Stephen Vesper, Elisabet Johansson, Atin Adhikari, Patrick Ryan, Linda Levin, Shu Zheng, Jeff Burkle, Sergey A. Grinshpun, James Lockey, David Bernstein, Manual Villareal, Gurjit K.K. Hershey, Grace LeMasters

Article Number

University of Cincinnati, Department of Environmental Health, Cincinnati OH, United States Keywords: mold, endotoxin, b-glucan, asthma, exhaled nitric oxide

## Life Style And Home Environmental Factors May Explain The Racial Disparities Of Asthma And Allergy Among Children In Northeast Texas

Yuexia Sun, Jan Sundell

Pennsylvania State University, State College PA, United States

Keywords: Asthma and allergy, Child, Home environment, Racial disparity

### On The Associations Between Day Care Attendance And Asthma And Allergy Among Children In Northeast Texas

Yuexia Sun, Jan Sundell

Pennsylvania State University, State College PA, United States

Keywords: Daycare attendance, Asthma and allergy, Child,

### Consideration Of The Change Of Material Emission Signatures Due To Long-term Emissions For Enhancing VOC Source Identification

Kwanghoon Han, Jensen J. Zhang, Henrik N. Knudsen, Pawel Wargocki, Beverly Guo

Syracuse University, Syracuse NY, United States

Keywords: Material emission signature, PTR-MS, VOC, Source identification, Long-term emission

### Source Apportionment Studies of Indoor Coarse Particulate using Regression Analysis, Factor Analysis And Chemical Mass Balance

Balakrishna Gurugubelli, Shamsh Pervez, Yasmeen Pervez

Pt. Ravishankar Shukla University, Raipur, India

Keywords: source apportionment, coarser particulate, lindoor environment, chemical mass balance, factor analysis

### Indoor/outdoor/personal Particulate Relationship And Source Apportionment Studies Of Selected Workshop Indoors

Methew James, Shamsh Pervez, Yasmeen Pervez

Pt. Ravishankar Shukla University, Raipur, India

Keywords: source apportionment, workshop indoors, indoor/outdoor relationship, fine particulate matter, chemical mass balance

# Variation Assessment Of Heavy Metals Source Apportionment In Urban Indoors, Ambient And Personal Levels Of Central India

Shamsh Pervez, Neha Dubey, John Watson

Pt. Ravishankar shukla university, school of studies in chemistry, raipur, India

Keywords: source apportionment, PM heavy metals, ambient and indoor, personal exposure, chemical mass balance

#### Behavioral Thermoregulation during Human Sleep Deduced from Heat Transfer Analysis

Tomonori Sakoi, Kazuyo Tsuzuki

Shinshu University, Ueda, Japan

Article Number

Keywords: Sleep, Thermal environment, Bedclothes, Behavioral thermoregulation, Thermal manikin

### Questionnaire Survey on Indoor Air Quality and Maintenance of Sanitary Environment in Buildings

Kenichi Azuma, Koichi Ikeda, Haruki Osawa, Naoki Kagi, U. Yanagi, Tomoko Shimodaira, Hideki Saito, Ryota Kamakura

Kinki University Faculty of Medicine, Department of Environmental Medicine and Behavioural Science, Osakasayama, Japan

Keywords: Project and facilities management/maintenance, Surveys, Standards, guidelines, codes, Regulations

#### **Health Risks And Toxic Effects of Indoor Secondary Organic Aerosols**

Kenichi Azuma, Norikazu Namiki, Naoya Nishimura, Kazuhiko Sekiguchi, Naoki Kagi, Hajime Tamura, Yoshihide Suwa, Syuji Fujii

Kinki University Faculty of Medicine, Department of Environmental Medicine and Behavioural Science, Osakasayama, Japan

Keywords: Secondary organic aerosols, Ultrafine particles, Risk, Toxicology

#### Numerical Investigation Of Natural Convection In A Cavity Using An Open Geometry.

Boris Brangeon, Alain Bastide, Patrice Joubert, Michel Pons

Piment, Le Tampon, Réunion

Keywords: Direct Numerical Simulation, Natural convection, Open enclosures, Boundary conditions

#### An Integrated Indoor Air Quality Audit Approach for Public Buildings

Ehsan Asadi, Manuel Carlos Gameiro da Silva, José J. Costa

University of Coimbra, Coimbra, Portugal

Keywords: Indoor air quality (IAQ), IAQ audit, Air exchange rate (AER), Metabolic CO2, Public buildings

#### Absence of Classroom Ventilation: A Call for Research and Resolution

Brian K. Kasher

Charlotte Mecklenburg Schools, Environmental Management, Charlotte NC, United States Keywords: Carbon Dioxide, Academic Performance, School, Building Science, Natural Ventilation

### Using Air Liquid Interface In Vitro Study Examines The Response Of Ozone/ ß-pinene Reaction Products

Pei-Chih Wu, Si-Ning Chen, Der-Jen Hsu, Yin Jan Wang

Dept. of Occupational Safety and Health, Chang Jung Christian University, Taiwan, Taiwan, Taiwan

Keywords: Air Liquid Interface, Cell viability, Ozone, &#946,-pinene, Secondary Organic Aerosols

#### Numerical Prediction of Infection Process By Coupled CFD And SIR Model In Indoor Space

Kazuhide Ito

Kyushu University, IGSES, Fukuoka, Japan

Article Number

Keywords: CFD, Epidemiological model, Infectious bio-aerosol, Airborne transmission, Coupled analysis

#### Study on the Effect of Local Climate to Thermal Comfort in China

Bin Cao, Yingxin Zhu, Qin Ouyang

Tsinghua University, Department of Building Science, Beijing, China

Keywords: field study, local climate, thermal comfort, thermal adaptation, life style

#### **Contaminant Source Location Approach Based On Multi Hypothesis Position**

Pang Liping, Qu Hongquan

Beihang Uinversity, Beijing, China

Keywords: Accidental contaminant, source location, multi-hypothesis position, location

probability function, source identification

#### Indoor Air Quality In Schools Of Different Socio-economic Status In Mumbai, India

Rashmi S. Patil, Srinidhi Balasubramaniam

Indian Institute of Technology Bombay, Centre for Environmental Science and Engineering,

Mumbai, India Keywords: Indoor

#### **Health Consequences - Pollutants In Indoor Environment**

Gaute Flatheim

Flatheim AS, Stavanger, Norway

Keywords: particulate matter, gaseous pollutants, mycotoxin, symptoms

### In vitro investigation of the biological effects associated with human lung cells exposed to several indoor air source

Philomena M. Bluyssen, Ilse L. Tuinman, Marcel J. Alblas, Jolet E. van de Bree, Marc M.G.

Houtzager, Ingeborg M. Kooter

TNO, Delft, Netherlands

Keywords: source emissions, ultra fine dust, indoor pollution sources, lung cell exposure, health

effects

### A New Method For Detecting Low Concentrations Of Airborne Aspergillus In Hepa-filtered Hospital Air

Joe C. Spurgeon, Gregory Spahr

Bayshore Environmental, Inc., Fullerton CA, United States

Keywords: Bioaerosols, qPCR, Bi-Air, Health Care

#### Ozone and Ozone By-Product Levels within Commercial Aircraft Cabins

Clifford P. Weisel, Weschler Charles, Krishan Mohan, Shahnaz Alimokhtari

Environmental and Occupational Health Sciences Institute-UMDNJ, Exposure Science Division,

Piscataway NJ, United States

Keywords: indoor air chemistry, carbonyls, skin oils, squalene, occupant density

**Article** Number

#### Indoor Air Quality And Chemistry In A Large Wooden Building

Sarka Langer, Andreas Fischer, Evert Ljungström IVL Swedish Environmental Research Institute, Göteborg, Sweden

Keywords: ozone, terpenes, ultrafine particles,

#### Experimental Evaluation Of Thermal Environment And Ventilation Effectiveness In A Room **Heated By Warm Air**

Michal Krajcík, Angela Simone, Bjarne W. Olesen, Dusan Petrás

Slovak University of Technology, Faculty of Civil Engineering, Department of Building Services, Bratislava, Slovakia

Keywords: warm air heating, radiant heating, thermal environment, ventilation effectiveness

#### The Building Assessment Survey And Evaluation Study: Important Findings And Lessons **Learned Five Years After Public Release**

Laureen E. Burton

US Environmental Protection Agency, Washington DC, United States

Keywords: indoor air quality, office buildings, field study,

#### Identification Of Particulate Contaminant Source Locations In Enclosed Spaces With Inverse **CFD Modeling**

Tengfei (Tim) Zhang, Hongzhu Li, Shugang Wang

Dalian University of Technology, Dalian, China

Keywords: Inverse modelling, Particulate, Source circumscription, Quasi-reversibility, Lagrangianreversibility

#### Experimental Study Of Ultrafine Particles Emitted By Cooking Activities In Hong Kong

Man-Pun Wan, Chi-Li Wu, Gin-Nam Sze To, Christopher Chao

Nanyang Technological University, Singapore, Singapore

Keywords: Ultrafine particles, PM2.5, Cooking, Homes, Number concentration

#### Inhalation Exposure To Brominated Flame Retardants In The Sleeping Microenvironment: **Preliminary Modeling And Results**

Brandon E. Boor, Atila Novoselac, Richard L. Corsi

The University of Texas at Austin, Civil, Architectural & Environmental Engineering, Austin TX,

**United States** 

Keywords: SVOCs, PBDEs, Exposure, Material Emissions, Pollutant Transport

#### The Significance Of Fresh Air From Outside: Getting To Know The World Through Air

Bettina Hauge

University of Copenhagen, Copenhagen, Denmark

Article Number

Keywords: Airing practices, Anthropology, qualitative methods, People's everyday lives, Phenomenology, Impression management

#### A Field Study Investigating Trichloroethylene Soil Vapor Intrusion Using TO-17

Neil Crain, Richard Corsi, Matthew Jordan, Carrie Bradford, John Villanacci

The University of Texas at Austin, Austin TX, United States

Keywords: Sorbent Tubes, TCE, Simplified Approach, Indoor Environment

#### **Relationship Between Vapor Intrusion and Human Exposures**

Carrie M. Bradford, Natalie Archer, Tina Walker, Benjamin C. Blount, Richard L. Corsi, Neil Crain, John F. Villanacci

Texas Department of State Health Services, Environmental & Injury Epidemiology & Toxicology Unit, Austin TX, United States

Keywords: Soil-vapor intrusion, Inhalation exposure, Biological Testing, Trichloroethylene

#### **Variance Components of Indoor and Outdoor VOC Concentrations**

Chunrong Jia, Stuart A. Batterman, George E. Relyea

University of Memphis, Memphis TN, United States

Keywords: Volatile organic compound, indoor air, variability, partition

#### **Indoor Coated Particle Resuspension Due to Human Walking**

Xinyu Zhang, Andrea Ferro, Goodarz Ahmadi

Clarkson University, Civil and Environmental Engineering, Potsdam NY, United States

Keywords: Anthrax spore, detachment, resuspension, human walking

#### Indoor-outdoor differences in ultrafine particles in homes near a highway

Christina H. Fuller, Wig Zamore, Marie Manis, John Durant, Doug Brugge, John Spengler Harvard School of Public Health, Environmental Health, Boston MA, United States Keywords: near-highway, particle number, exposure assessment, monitoring

# **Evaluation Of Electrostatic Forces And Its Effect On Indoor Particle Resuspension Due To Human Walking**

Xinyu Zhang, Goodarz Ahmadi, Jing Qian, Andrea Ferro

Clarkson University, Potsdam NY, United States

Keywords: Capacitor theory, electrostatic forces, particle resuspension, human walking

#### The Effect Of Floor Surface Temperature On Occupants' Relaxation

Hyeonjeong Lee, Chungyoon Chun

Yonsei University, Seoul, Korea, Republic of

Keywords: Thermal, Comfort, Human subjects,

### Measurement And Calculation Model Of Reaction Rate Constant Of Chlorine Dioxide Gas With Tedlar Bag

Fumihiko Shinoda, Hitomi Tsutsumi, Shin-ichi Tanabe, Toshiki Isahaya, Takashi Ito, Masakazu Setsujima, Kouichi Nakahara

Article Number

Waseda University, Tokyo, Japan

Keywords: Decontamination and disinfection, Air cleaning, Health care facilities, Measurements,

Infectious disease

## Influence Of Tunnel Winds On Assessment Of Indoor Air Quality In The Underground Platform Of The Railway Station In Japan

Tamami Kawasaki, Takashi Kyotani, Tomoyoshi Ushiogi, Hunjun Lee, Toshio Hayakawa Railway Technical Research Institute, Toyko, Japan

Keywords: railway stations, airborne fungi, airborne bacteria,

#### **Indoor Source Of Phthalates Exposure In Taiwan Households**

Nai-Yun Hsu, Chung-Yu Chen, Ching-Chang Lee, Huey-Jen Su

College of Medicine, National Cheng Kung University, Department of Environmental and Occupational Health, Tainan, Taiwan

Keywords: phthalates, housing characteristics, wooden floor, wax, parental occupations

#### Particle Deposition in 90° Bends - Comparison of Different CFD Models

Ke Sun, Hai Jiang, Lin Lu

Dept. Building Services Engineering, the H K Polytechnic Univ, Hong Kong SAR, China Keywords: Particle deposition, IAQ, Turbulent models, Near-wall models, 900 bend

### A Variable Volume Loading Method To Determine The Initial Emittable Concentration Of VOC And Formaldehyde In Building Materials

Allu Formaluellyue ili bullullig iviateriais

Jianyin Xiong, Wei Yan, Yinping Zhang, Shaodan Huang

Tsinghua University, Beijing, China

Keywords: Indoor air quality (IAQ), volatile organic compounds (VOC), formaldehyde, initial emittable concentration, perforator method

### Association Of Turbulent Diffusion Coefficient With Air Change Rate In Naturally-Ventilated Residences

Kai-Chung Cheng, Viviana Acevedo-Bolton, Ruo-Ting Jiang, Neil Klepeis, Wayne Ott, Lynn Hildemann

Stanford University, Stanford CA, United States

Keywords: eddy diffusion, Fick's Law, exposure, homes, mixing rate

### Photocatalytic Decomposition Of MtBE Under Illumination Of Both Near-UV And Visible Light

Assisted By Carbon/nitrogen Doped Tio<sub>2</sub>/ITO Composite Photocatalysts

Chung-Hsuang Hung, Chia-Wei Lee, Kee-Rong Wu

National Kaohsiung First University of Science and Technology, Kaohsiung, Taiwan

Keywords: MtBE, photocatalysis, TiO2, ITO, visible light

### Emission measurement of di (2-ethylhexyl) phthalate (DEHP) from building materials under varving adsorption area with Micro chamber

Akihiro Kawamura, Hyuntae Kim, Hoon Kim, Shin-ichi Tanabe, Iguchi Yuka

WASEDA University, Shinjyuku-ku, Japan

Keywords: SVOCs, Measurements, Sources/emissions,

Article Number

### Characterization Of Formaldehyde Emissions From Plywood: Results From An Inter-laboratory Comparison

Christophe YRIEIX, François MAUPETIT CSTB, Saint-Martin d'Hères, France

Keywords: Round Robin Test, Emission Test Chamber, Formaldehyde, Plywood, ISO 16000

# The Relationship Between Building Structures In Finnish Hospitals And The Perceived Symptoms Of Staff

Eero J. Palomaki, Isto P. Maarttola, Ulla-Maija Hellgren, Kari Reijula Finnish Institute of Occupational Health, Tampere, Finland Keywords: Indoor air quality, design

#### One Minute Resolution PM10 In Wood Burning New Zealand Homes

Ian D. Longley, Jennifer Gadd NIWA Ltd, Auckland, New Zealand Keywords: residential, particles, sources, field study

#### **Bioaerosols And Other Airborne Contaminants In Dairy Plants**

Karabo Shale, Katleho Mokoena Central University of Technology, Free State, Bloemfontein, South Africa Keywords: bioaerosol, dairy, food safety, airborne contaminants

### Food-borne Micro-organisms Associated With Aerosols In The Food Preparation Area Of HIV/AIDs Hospices In Central South Africa

Jane Nkhebenyane, Karabo Shale, Pierre Venter, Ryk Lues Central University of Technology, Free State, Bloemfontein, South Africa Keywords: bioaerosol, HIV/AIDS hospice, kitchen design, food safety

# Characteristics Of Emissions Of Air Pollutants From Incense And Candle Burning In An Experimental House

Audrey Manoukian, Brice Temime-Roussel, Mélanie Nicolas, François Maupetit, Etienne Quivet, Henri Wortham

Laboratoire Chimie Provence - Equipe Instrumentation et Réactivité Atmosphérique, Marseille Cedex 3, France

Keywords: Incense/candle burning, volatile organic compounds, aerosols, indoor air quality

#### Post-intervention Radon Measurements And Evaluation In School Building

Ilaria Oberti, Andrea Ratti, Silvia Arrigoni, Pietro Imbrogno Politecnico di Milano, Milan, Italy

Keywords: Radioactive gas, Indoor Air Quality, Mitigation Techniques, Depressurization of soil

#### Improvement Of Thermal Environment In Railroad Station Using Local Wind

Yuka Nakamura, Junta Nakano, Shin-ichi Tanabe, Yuki Yamada, Kiyoshi Sakamoto, Toshihiko Sato, Tadashi lino

Article Number

WASEDA University, Tokyo, Japan

Keywords: Railway stations, Field survey, Thermal environment, Environment-conscious, Local

wind

#### Seasonal Variation Of Indoor Volatile Organic Compounds In Public Spaces In Korea

Kiyoung Lee, Soogil Lim, Sung-gi Jang, Young-Kyo Seo, Sung-Ok Baek

Seoul National University, Seoul, Korea, Republic of

Keywords: Volatile organic compounds, measurements, commercial, season

#### Need Of Local Evidence For Policy Change: Secondhand Smoke Exposures In Asian Countries

Kiyoung Lee, Youngtae Cho

Seoul National University, Seoul, Korea, Republic of

Keywords: smoke-free policy, particles, evidence based regulations, developing countries, Asia

#### Adsorption Of P-dichlorobenzene On The Clothes To Assess The Effect Of Its Exposure

Naohide Shinohara, Seiji Ochiai

National Institute of Advanced Industrial Science and Technology (AIST), Research Institute of

Science for Safety and Sustainability (RISS), Tsukuba, Ibaraki, Japan

Keywords: Absorption, p-dichlorobenzene, cloth, Exposure

### Seasonal Variation in Monthly Average Air Change Rates Using Passive Tracer Gas Measurements

Marie Frederiksen, Niels Christian Bergsøe, Barbara Kolarik, Michal Spilak, Gabriel Bekö, Sine Gustavsen, Geo Clausen, Lars Gunnarsen

Danish Building Research Institute (SBi), Hoersholm, Denmark

Keywords: PFT, dwelling, ACR, indoor air quality, exposure

### Improvement of Indoor Air Quality in Traditional Chinese Medicine Institutions--Using Moxibustion as an Example

Sy-Yuan Kang, Chao-Heng Tseng, Yu-Lin Chen, Huang-Chin Wang, Cheng-Wei Mai National Taipei University of Technology, Institute of Engineering Technology, Taipei, Taiwan Keywords: moxa, local exhaust ventilation, air purifiers, health risks

# Influence Of Temperature, Relative Humidity, And Air Exchange Rate On The Emission Of Volatile Organic Compounds And Particles From Burning Fragrances In An Experimental Chamber

Audrey Manoukian, Brice Temime-Roussel, Etienne Quivet, Henri Wortham

Laboratoire Chimie Provence - Equipe Instrumentation et Réactivité Atmosphérique, Marseille Cedex 3. France

Keywords: Incense/candle burning, aerosols, indoor air quality,

### The influence of temperature on the emission of di-(2-ethylhexyl) phthalate (DEHP) from PVC flooring in the emission cell FLEC

Per Axel Clausen, Zhe Liu, Vivi Kofoed-Sørensen, John C. Little, Peder Wolkoff National Research Centre for the Working Environment, Copenhagen Ø, Denmark Keywords: SVOC, emission, chamber, environmental conditions

Article Number

#### The effects of indoor air pollution on blood pressure in adult women living in rural China

Jill Baumgartner, James J. Schauer, Majid Ezzati, Lin Lu, Chun Cheng, Jonathan Patz, Leonelo Bautista

Institute on the Environment, St. Paul MN, United States

Keywords: biomass, solid fuels, indoor air pollution, blood pressure, China

#### Digital Demand Controlled Ventilation - An Alternative To Static Pressure Controlled

Mads Mysen, Peter Schild, Finn Drangsholt, Bjørn Tore Larsen

Stiftelsen vekst, OSLO, Norway

Keywords: Demand controlled ventilation, Energy performance, Building controls & automation,

Ventilation, Schools

### Nicotine In Dust Samples Collected From Children's Bedrooms And Daycare Centers In Denmark

Charles J. Weschler, Sarka Langer, Andreas Fischer, Gabriel Bekö, Jørn Toftum, Geo Clausen University of Medicine and Dentistry of New Jersey, Piscatawy NJ, United States Keywords: smoking, ETS, cotinine, exposure, changing behaviour

#### Particle Exposure Mitigation In Cooking Activities Through A Residential Ceiling Hood

Fausto Arpino, Giorgio Buonanno, Aldo Russi, Luca Stabile

DiMSAT- University of Cassino, Cassino (FR), Italy

Keywords: Exposure (inhalation), Contaminants (ultrafine particles), Air cleaning,

#### **Evaluation of Mold Sanitation Methods**

Lennart Larsson, Mirko Peitzsch, Aime Must, Erica Bloom

Lund University, Department of Laboratory Medicine, Lund, Sweden

Keywords: Mold, mycotoxins, mass spectrometry, building materials, sanitation

#### Individual Differences In Predicted Thermo-Physiological Responses To Entrapment: Heat

#### Stress In A Disabled Submarine Or Similar Enclosed Environment

Miyo Yokota, Berglund Larry, Wayne Horn

USARIEM, Natick MA, United States

Keywords: Thermoregulatory model, Disabled submarine, Individual variability, Anthropometry,

Core temperature

#### User Satisfaction With Indoor Air Quality In Government Office Buildings Of The U.S.

Joon-Ho Choi, Vivian Loftness, Azizan Aziz

Missouri University of Science and Technology, Civil, Architectural & Environmental Engineering, Rolla MO, United States

Keywords: Indoor air quality, user satisfaction, post-occupancy evaluation, survey, on-site measurement

#### Diversity, Seasonal Dynamics And Sources Of Bacteria In House Dust

**Article** Number

Martin Täubel, Helena Rintala, Miia Pitkäranta, Mika Toivola, Lars Paulin, Sirpa Laitinen, Juha Pekkanen, Anne Hyvärinen, Aino Nevalainen

National Institute for Health and Welfare, Kuopio, Finland

Keywords: house dust, microbes, asthma and allergy, residential homes, sequencing

#### Mercury Emissions From PMA-catalyzed Polymer Floors: A Case For Standardized Data **Collection Tools**

Marian L. Heyman, Christina R. Bush

Connecticut Department of Public Health, Environmental and Occupational Health Assessment

Program, Environmental Health Section, Hartford CT, United States

Keywords: Mercury Floor, Rubber floor, Schools, Questionnaire

#### Microbial Toxins In Surface Swab And Dust Samples From School Buildings In Three European Countries.

Mirko Peitzsch, Michael Sulyok, Martin Täubel, Vinay Vishwanath, Alicia Borras, Esmeralda Krop, Asko Vepsälainen, Jose Jacobs, Jan-Paul Zock, Anne Hyvärinen, Dick Heederik, Aino Nevalainen, Lennart Larsson

National Institute for Health and Welfare, Kuopio, Finland

Keywords: Schools, Moisture/dampness, Biological, Measurements, Asthma

#### Experimental Study Of Ultrafine Particle Penetration For Straight and Double Bend Cracks Alvin Lai

City University of Hong Kong, Department of Building and Construction,, Kowloon, Hong Kong Keywords: Penetration, Indoor-Outdoor Relationship, Cracks, Ultrafine Particles

#### Quantitative Relationships Between Occupant Satisfaction And Aspects Of Indoor **Environmental Quality And Building Design**

Monika Frontczak, Stefano Schiavon, John Goins, Edward Arens, Hui Zhang, Pawel Wargocki International Centre for Indoor Environment and Energy, DTU Civil Engineering, Kgs. Lyngby, Denmark

Keywords: Satisfaction, occupant's responses, office buildings, post-occupancy evaluation

#### Comparing CO<sub>2</sub> tracer techniques for estimating ventilation rates in classrooms

Richard J. Shaughnessy

, Bradley Turk, Demetrios Moschandreas, Ulla Havrinen-Shaughnessy

University of Tulsa, Tulsa OK, United States

Keywords: schools, indoor environmental quality, buildup, airflow

#### Evaluation Of HVAC Operation And Building Conditions By Carbon Dioxide And Dew Point Monitoring

David W. Bearg, PE, CIH

Life Energy Associates, Concord MA, United States

Keywords: Healthy Buildings, Ventilation Performance, Moisture Management, Continuous

Commissioning, Infiltration Assessment

#### PM2.5 Air Pollution and Secondhand Smoke in 94 US Casinos

Article Number

James L. Repace, Ruo-Ting Jiang, Viviana Acevedo-Bolton, Kai-Chung Cheng, Neil E. Klepeis, Wayne R. Ott, Lynn M. Hildemann

Tufts Univ. School of Medicine, Boston, MA, Public Health and Community Medicine (Visiting Prof.), Bowie MD, United States

Keywords: Health & Human Perceptions - Risk, Exposure - Inhalation, Locations - casinos,

#### **Ventilation Rates in Schools in the Southwestern United States**

Richard Shaughnessy, Ulla Haverinen-Shaughnessy, Demetrios Moschandreas, Eugene Cole University of Tulsa, Tulsa OK, United States

Keywords: carbon dioxide, outdoor air, indoor environmental quality, schools, ventilation

#### Climate Change, the Indoor Environment and Health: Priority Issues for Action

John Spengler

Harvard School of Public Health, Environmental Health, Boston MA, United States Keywords: Climate change, health, review,

#### Ultrafine Particles: 3 Years of Measurements in the NIST Test House

Lance Wallace, Andrew Persily, Cynthia Howard-Reed, Donghyun Rim, Steven Emmerich, Fang Wang, Hoang Chi, Michal Green, Jung-il Choi

National Institute of Standards and Technology, Reston VA, United States Keywords: particles, ultrafine particles, coagulation, cooking

#### Thermal Comfort and Perceived Air Quality of a PEC System

Edward A. Arens, Hui Zhang, Wilmer Pasut, Ashley Warneke, Fred Bauman, Hiroshi Higuchi University of California at Berkeley, Berkeley CA, United States

Keywords: Air movement cooling, absence from workstation, body thermal plume,

#### Climate Change The Indoor Environment And Health - Priority Issues For Action

William W. Nazaroff

University of California, Civil and Environmental Engineering, Berkeley CA, United States Keywords: climate change, contaminants, controls and prevention, health and human perceptions

#### **Nucleation And Growth Of Freshly-formed Particles From Limonene Ozonolysis**

Chi Hoang, Donghyun Rim, Lance Wallace, Andrew Persily

National Institute of Standards and Technology, Building Environment, Gaithersburg MD, United States

Keywords: ozone, limonene, nanoparticles, nucleation

### Effects of ozone treatment on fungal growth, chemical components and surface morphological characteristics of wood flooring materials

Chi Hoang, Tinh Nguyen, Andrew Persily, Deborah Stanley National Institute of Standards and Technology, Gaithersburg MD, United States Keywords: biology, Decontamination and disinfection

Article Number

#### Numerical Simulation Of VOCs Dispersion With The Effect Of Particles.

Huan Xie, Chang Nyung Kim, Baoqing Deng

CFD lab,Department of Mechanical Enqineering, Kyung Hee University, Suwon, Korea, Republic of

Keywords: Volatile organic compounds, CFD, Carpet, Indoor air, Adsorption

#### Aircraft noise, overheating and poor air quality in London primary schools' classrooms

Azadeh Montazami, Fergus Nicole, Mike Wilson

London Metropolitan University, London, United Kingdom

Keywords: Overheating, High level of background noise, Air quality, Primary schools' classroom,

Natural ventilation

### Modeling Exposures to Air Pollutant Mixtures: Application of Copula Methods to the RIOPA Data

Chunrong Jia, Stuart A. Batterman, Feng-Chiao Su

University of Memphis, Memphis TN, United States

Keywords: Volatile organic compound, VOC, mixture, copula, personal exposure

# An Algorithm For Characterizing The Aerodynamic Particle Size Profile Of Bacterium-laden Expiratory Aerosols And Its Validation Using Benign Bacteria

Yang Yang, G.N. Sze To, Christopher Y.H. Chao

The Hong Kong University of Science and Technology, Department of Mechanical Engineering, Hong Kong, Hong Kong

Keywords: Bacterium-laden expiratory aerosols, aerodynamic diameter, infectious respiratory disease, stochastic modeling, Monte Carlo method

### Formulas for Predicting Elementary Students' Thermal Comfort to Improve the Learning Environment in Classrooms

Yuki YANAI, Toshiharu IKAGA, Tatsuya Kobayashi

Graduated School of Keio University, Yokohama, Japan

Keywords: school, thermal sensation, field survey, questionnaire survey, logistic regression analysis

### Ultrafine particle emissions from cigarette smoldering, incense burning and vacuum cleaner motor operation

C. L. Wu, G. N. Sze-To, Christopher Y. H. Chao, M. P. Wan

The Hong Kong University of Science and Technology, Department of Mechanical Engineering, Hong Kong, Hong Kong

Keywords: Ultrafine particles, cigarette smoldering, incense burning, vacuum cleaner, emission rate

#### **Reducting The Risk Of Heat Stroke During Bathing**

Yuri Sugimoto, Toshiharu Ikaga, Shingo Hori, Masaru Suzuki Graduate School of Keio University, Yokohama, Kanagawa, Japan Keywords: Healthy homes, building and cimmunities, Thermal, Risk,

Article Number

#### Assessment On Perceived Odor Intensity Of Bioeffluents Expressed By VOC Concentration

Go Iwashita

Tokyo City University, Architecture, Tokyo, Japan Keywords: Body odor, Olfactometer, Occupants, Panel

#### **Extremely Efficient And Clean Cooking/lighting Device For Rural Households**

Anil K. Rajvanshi, S.M. Patil, A.M. Ranaware, V.J. Chopade, Noorie Rajvanshi Nimbkar Agricultural Research Institute, Phaltan, India Keywords: Lanstove, life cycle analysis, cooking and lighting, developing countries, Kerosene

#### **Chemical Concentrations In New California Homes And Garages**

Peggy L. Jenkins, Ryan D. Johnson, Thomas J. Phillips, Francis J. Offermann CA Air Resources Board, Research Division, Sacramento CA, United States Keywords: Volatile organic chemicals, Reference Exposure Levels, California Proposition 65,

### The Influence Of The Ventilation On Performance, Physiological Response And Occupant's Perception

Takaki Hibino, Go Iwashita

Tokyo City University, Tokyo-Pref, Japan

Keywords: Lboratory studies, Human subjects, ventilation, performance/costs of indoor pollution

### Standardization Of Solid-phase Microextraction Method For The Determination Of Airborne Biogenic Volatile Organic Compounds In Cleaning Products

Yu Huang, Steven Sai hang Ho, Kin Fai Ho, Shuncheng LEE, Yuan Gao The Hong Kong Polytechnic University, Hong Kong, Hong Kong Keywords: monoterpenes, method standardization, household reagents,

### Concentration of House Dust Mites and Endotoxin in Indoor Environment: A COCOA Cohort Study

Yoon-Shin Kim, Cheol-Min Lee, Keun-Young Kim, Jin-Won Jung, Seung-Cheol Hong, Soo-Jong Hong

INJE University, Gimhae, Korea, Republic of Keywords: house dust mite, endotoxin

#### Inter-zonal Migration Of Airborne Infectious Particles In Isolation Wards By Human Movement

W. T. Leung, G. N. Sze-To, Christopher Y. H. Chao, Joseph K. C. Kwan, Samuel C. T. Yu, C. K. Wong The Hong Kong University of Science and Technology, Department of Mechanical Engineering, Hong Kong, Hong Kong

Keywords: Migration ratio, E. coli, Negative pressure, Containment effectiveness, Hospital Environment

### Technical solutions for reducing indoor residential exposures to ultrafine particles from second-hand cigarette smoke infiltration

Alireza Afshari, Siamak Rahimi Ardkapan, Niels Christian Bergsøe, Matthew S. Johnson Danish Building Research institute, Aalborg University, Energy and Environment, Hoersholm, Denmark

Article Number

Keywords: Second-hand smoke, Cigarette, Ultrafine particles, In-duct air cleaner, Sealing

## Performance of a Streamer Plasma Air Purifier Examined with Sensory Assessments of Air Quality

Lei Fang, Pawel Wargocki, Adam Targowski, Toshio Tanaka, Kenkihi Kagawa International Centre for Indoor Environment and Energy, Department of Civil Engineering, Techinical University of Denmark, Lyngby, Denmark Keywords: Air cleaning, Comfort, Ventilation,

### An Intervention Study In Moisture Damaged Homes – preliminary results before renovation

Anne Hyvärinen, Martin Täubel, Michael Sulyok, Vinay Vishwanath, Mari Turunen, Kati Järvi, Riitta-Liisa Patovirta, Tomi-Pekka Tuomainen, Juhani Pirinen, Rudolf Krska, Juha Pekkanen, Aino Nevalainen

National Institute for Health and Welfare, Department of Environmental Health, Kuopio, Finland Keywords: Residential, Moisture/dampness, Microbes and microbial toxins, Other respiratory, Interventions

#### The Quality Of Mechanical Ventilation Systems In Newly Built Dutch Dwellings

Froukje van Dijken, Jaap R. Balvers, Atze C. Boerstra BBA Indoor Environmental Consultancy, Rotterdam, Netherlands Keywords: Houses, Balanced mechanical ventilation, Indoor air quality, Thermal comfort, Noise

#### A Model Predicting Window Opening and Heating Set-point Preferences

Rune V. Andersen, Bjarne W. Olesen, Jørn Toftum Technical University of Denmark, Department of Civil Engineering, Lyngby, Denmark Keywords: Occupant Behaviour, Simulation, Energy, Window opening, Heating set-point

#### Effect of Individual Inlets on Overall LMA Distribution in a Room with Multiple Inlets

Hwataik Han, Cheol-Yong Shin, In-Bok Lee, Kyeong-Seok Kwon Kookmin University, Seoul, Korea, Republic of Keywords: Ventilation effectiveness, Tracer gas, Local mean age, Multiple inlets, Livestock

#### **Evaluation Of Indoor Air Quality For Renovation Building**

Janghoo Seo, Jonghun Kim, Shinsuke Kato Chosun University, Architecture, Gwangju, Korea, Republic of Keywords: indoor air quality, renovation building, Ammonia, chemical reaction

#### The Stack Effect Influence On Air Exchange Rate In Dwelling Buildings

Anatolijs Borodinecs, Baiba Gaujena, Jurgis Zemitis, Andris Kreslins Riga Technical University, Institute of Heat, Gas and Water Technology, Riga, Latvia Keywords: Airtightness, CO2, ventilation rate, stack effect, internal building' elements

## The Air Quality Inside The Showcase Containing The Remains Of The Danish King St. Knud The Holy (+AD 1086)

Article Number

Morten Ryhl-Svendsen, Kaare L. Rasmussen, Lilian Skytte, Jens Glastrup National Museum of Denmark, Department of Conservation, Kgs. Lyngby, Denmark Keywords: exhibition display, wood off-gassing, church, reliquary, cultural heritage

#### Occurrence Of Dampness And Mould In Schools In Three Climatic Regions Of Europe

Ulla Haverinen-Shaughnessy, Mari Turunen, Alicia Borras, Jan-Paul Zock, Jose Jacobs, Richard Shaughnessy, Martin Taubel, Anne Hyvärinen, Juha Pekkanen, Aino Nevalainen National Institute for Health and Welfare, Kuopio, Finland Keywords: dampness, mould, elementary schools,

#### Influence Of Season And Sampling Methods On The Measured Exposure To Indoor

#### **Microorganisms And Their Inflammatory Potential**

Mika Frankel, Anne Mette Madsen, Erik W. Hansen

National Research Center for the Working Environment, Copenhagen, Denmark Keywords: Fungal spores, Bioaerosol, Exposure levels, Air and surface sampling, Seasonal variation

#### **Passive Sorption Of Organic Compounds On Clay Bricks**

Morten Ryhl-Svendsen

National Museum of Denmark, Department of Conservation, Kgs. Lyngby, Denmark Keywords: formic acid, acetic acid, formaldehyde, VOC, museum environment

### Indoor Air Risks and Impacts of Alternative Policy Interventions in the EU Countries - the IAIAQ study

Matti J. Jantunen, Eduardo de Oliveira Fernandes, Paolo Carrer, Stylianos Kephalopoulos National Institute for Health and Welfare, Department of Environmental Health, Kuopio, Finland Keywords: indoor air quality, sources, exposures, health risks, policy benefits

#### Hybrid Ventilation as an Energy Efficient Solution for Low Energy Residential Buildings

Peter Foldbjerg, Thorbjørn Færing Asmussen

VELUX A/S, Hørsholm, Denmark

Keywords: Energy Performance, Residential, Hybrid Ventilation,

### The Impact Of Window Configuration On The Performance Of Energy And Daylight In Residential Buildings

Peter Foldbjerg, Nicolas Roy, Steven Ibsen

VELUX A/S, Hørsholm, Denmark

Keywords: Residential buildings, Simulation models, Daylight, Energy

#### **Integrated Exposure For Risk Assessment In Indoor Environments**

Arja Asikainen, Sean Semple, Denis Sarigiannis, Rudi Torfs, Spyros Karakitsios, Alberto Gotti, Katleen De Brouwere, Karen Galea, Martie van Tongeren, Matti Jantunen National Institute for Health and Welfare, Kuopio, Finland Keywords: consumer exposure, full chain modelling, internal dosimetry, pollutant case studies

Article Number

## An Intervention Study Of Air Cleaning And Allergy Avoidance At School - Effects On Exposure And Symptoms Of Allergy

Greta Smedje, Lena Elfman, Pia Kalm-Stephens, Lennart Nordvall, Robert Wålinder Occup & Environ Medicine, Uppsala, Sweden

Keywords: schools, allergy, air cleaning,

#### **Criteria For Specification Of The Indoor Environment Of Active Houses**

Peter Foldbjerg, Karsten Duer, Per Arnold Andersen, Ellen Kathrine Hansen, Per Friis Mortensen VELUX A/S, Hørsholm, Denmark

Keywords: Guideline, IEQ, Healthy homes,

#### Fine And Ultrafine Particles In 20 French Dwellings Related To Time-activity Diaries

Olivier RAMALHO, Anthony GREGOIRE, Séverine KIRCHNER CSTB - University of Paris-Est, Health division, Marne-la-Vallée Cedex 2, France Keywords: ultrafine particles, time-activity diaries, occupancy, optical particle counter, residential

### Alkaline Decomposition Of Alkali Sensitive Flooring Materials - Effect Of Concrete Surface Structure

Thale S W Plesser, Peter Blom SINTEF Building and Infrastructure, Oslo, Norway Keywords: Flooring, Adhesive, Degradation, Acrylate, Concrete

#### Styrene Exposure After A Fire Close To A Residential Building

Bruno Neff, Gerhard A. Wiesmüller Cologne Public Health Department (PHD), Cologne, Germany Keywords: Fire, Styrene, VOC, Iso-alkane, Indoor air

#### **Robust Indoor Climate Design**

Joe L. Leyten, Stanley R. Kurvers
Delft University of Technology, Faculty of Architecture, Delft, Netherlands
Keywords: comfort, User/occupant control of indoor environment, Commercial (offices, retail, service), Field studies

### Impact Of Airing Behaviour On Air Stuffiness In Schools And Daycares Centres: Development Of A Specific Tool For Ventilation Management

Jacques Ribéron, Mickael DERBEZ, Murielle LETHROSNE, Séverine KIRCHNER
Université Paris Est - CSTB, Champs-sur-Marne, France
Keywords: intervention study, operable windows, CO2 concentrations, air renewal, air stuffiness index

# Cumulative indoor exposures to Semi-Volatile Organic Compounds (SVOCs) in France: a health risk ranking based on dust ingestion route

Corinne Mandin, Nathalie Bonvallot, Fabien Mercier, Barbara LeBot, Philippe Glorennec University Paris Est / CSTB - Scientific and Technical Building Centre, Marne la Vallée, France Keywords: Ranking, SVOCs, Indoor dust, Health, Exposure

Article Number

### Laboratory Research On The Efficacy Of Chlorine Dioxide Fumigation For The Remediation Of Mold-contaminated Buildings

Doris Betancourt, Shannon Serre, Karin K. Foarde

US EPA, Durham NC, United States

Keywords: CIO2 gas, mold spores' inactivation, inactivation of mycotoxins, inactivation of

allergens

#### **Tobacco Smoke Bioaerosol**

Christina Pehrson, Bogumila Szponar, Beston Ridha, Jacek Dutkiewicz, Ewa Krysinska-Traczyk, Jolanta Sitkowska, Lennart Larsson Lund University, Lund, Sweden

Keywords: irritation, cancer, inhalation,

#### Impact Of Airing Behaviour On Indoor Air Quality In Schools And Daycare Centers

MICKAEL DERBEZ, Jacques Ribéron, Murielle LETHROSNE, Severine KIRCHNER Université Paris Est - CSTB, Champs sur Marne, France

Keywords: natural ventilation, user/occupant control of indoor environment, interventions,

#### **Building Performance Evaluation Of Newly Built School Buildings - A Pilot Study**

Sarah M. Juricic, Froukje van Dijken, Atze C. Boerstra BBA Indoor Environmental Consultancy, Rotterdam, Netherlands Keywords: Post occupancy evaluation, Perceived indoor environmental quality, CBE's Occupant IEQ Survey,

#### **Evaluating The Operation Of Three Air Cleaners Working Individually In A Clean Room**

Siamak Rahimi Ardkapan, Alireza Afshari, Niels Christian Bergsøe, Matthew S. Johnson Department of Energy and Environment, Danish building research institute, Aalborg University, Hørsholm, Denmark

Keywords: Air cleaner, Ozone, Particle,

#### **Personal Control and Thermal Comfort Classification**

Atze C. Boerstra

BBA Indoor Environmental Consultancy, Rotterdam, Netherlands

Keywords: Individual control, adaptive thermal comfort, local climatisation, standardisation

#### Effects Of Olfactory-relevant Emissions From Building Materials On Building- energy Demand

Jana Panašková, Birgit Müller, Dirk Mueller, Rita Streblow

Technische Universität Berlin, Hermann-Rietschel-Institut, Berlin, Germany

Keywords: Air quality, odours from materials, emissions, energy-efficient buildings

### Modeling The Effects Of Outdoor Use Of Portable Gasoline Powered Generator Exhaust On

**Indoor Carbon Monoxide Exposure** 

Steven J. Emmerich, Liangzhu Wang

Article Number

National Institute of Standards and Technology, Engineering Laboratory, Gaithersburg MD, United States

Keywords: models, residential, carbon monoxide,

### Squalene And Cholesterol In Dust Samples Collected From Children's Bedrooms And Daycare Centers In Denmark

Charles J. Weschler, Sarka Langer, Andreas Fischer, Gabriel Bekö, Jørn Toftum, Geo Clausen University of Medicine and Dentistry of New Jersey, Piscataway NJ, United States Keywords: desquamation, skin surface lipids, stratum corneum, cooking, ozonolysis

## Turbulence Intensity Performance Of A Personalized Ventilation Air Terminal Device At Different Perforation Rates.

Marta Chludzinska

Warsaw University of Technology, Faculty of Environmental Engineering, Air Conditioning and Heating Department, Warsaw, Poland

Keywords: personalized ventilation, thermal comfort, turbulence intensity,

#### Numerical And Experimental Investigation Of Particle Resuspension Due To Human Walking

Kyung Sul, Behrang Sajadi, Yilin Tian, Iman Goldasteh, Goodarz Ahmadi, Andrea R. Ferro Clarkson University, Potsdam NY, United States

Keywords: Indoor air, Indoor particle, Human activity, Moving mesh technique

#### The Danish Centre for Indoor Air and Health in Dwellings - CISBO

Torben Sigsgaard, Geo Clausen, Lars Gunnarsen, Steffen Loft, Ingunn S. Riddervold, Peder Wolkoff

International Centre for Indoor Environment and Energy, Copenhagen, Denmark Keywords: Multidisciplinary Research Centre, Indoor air and Health, Transition af knowledge,

Private housing

## Modern Health Worries In Sick Building Syndrome: The Västerbotten Environmental Health Study

Steven Nordin, Eva Palmquist, Anna-Sara Claeson, Linus Andersson, Pernilla Sandberg, Berndt Stenberg

Umeå University, Umeå, Sweden

Keywords: Health worry, Sick building syndrome

#### Cardiovascular Effects Of Indoor Exposure To Particles: Results From The PM-CARE Study

Serena Fossati, Patrizia Urso, Andrea Cattaneo, Anna C. Fanetti, Gaetano Garramone, Laura Ruggeri, Domenico Cavallo, Paolo Carrer

University of Milan, Dept. Occupational Medicine, Milan, Italy

Keywords: Particulate Matter, Personal exposure, Autonomic function, HRV, Suscptible subjects

### Healthy Lives In A Healthy Air: COPD Patients Have The Right To A Save Air And Environment. Point Of View From Patients Association.

Rosanna Franchi, Guglielmo De Luca, Fausta Franchi

Associazione Italiana Pazienti Bpco (Copd Patients Association), Rome, Italy

Article Number

Keywords: IAQ, chronic respiratory disease, tobacco smoke, allergy

## The Reduction Of Indoor Temperature Fluctuation By Using Phase Changing Materials Included In Some Building Components

Zhi-Gen Wu, Wen-Quan Tao, Ya-Ling He

Tongji University, School of Environmental Science and Engineering, Shanghai, China

Keywords: Phase change material, Building application, Thermal comfort,

### Spatial And Temporal Variability In Chlorination By-products Levels Within Indoor Swimming Pools

Vincent BESSONNEAU, Mickael DERBEZ, Olivier THOMAS, Michel CLEMENT

French School of Public Health-EHESP, Environmental and Health Research Laboratory, Rennes,

France

Keywords: Trihalomethanes, Trichloramine, inhalation exposure, sampling strategy

#### **Use Of Clothing For Body Cooling By Evaporation**

Tomonori Sakoi, Arsen Melikov, Zhecho Bolashikov, Hideaki Morikawa, Kunio Iwaki Shinshu University, Ueda, Japan

Keywords: Thermal comfort, Clothing, Evaporative cooling, Individual control, Office work

### Calibration Factors for Measuring PM2.5 Concentrations from Multiple Indoor Sources with a Real-Time Particle Monitor

Philip J. Dacunto, Ruo-Ting Jiang, Viviana Acevedo-Bolton, Kai-Chung Cheng, Neil E. Klepeis, James L. Repace, Wayne R. Ott, Lynn M. Hildemann

Stanford University, Civil and Environmental Engineering, Stanford CA, United States

Keywords: secondhand smoke, cooking, incense,

#### Differential Allergy Induction By Molds Found In Water-damaged Homes

Marsha D. Ward, Yong Joo Chung, Lisa B. Copeland, Stephen J. Vesper US Environmental Protection Agency, RTP NC, United States

Keywords: molds, allergy, asthma,

### Discussion On Thermal Adaptation In Stable Neutral-hot Air-conditioned Environment In Chongqing

Yu YANG, Bai-zhan Li, Hong LIU, Meilan TAN

Three Gorges Reservoir Key Laboratory of Ministry of Education, Chongqing University, Chongqing, China

Keywords: psychological adaptation, thermal sensation, skin temperature, hot-humid area

### Mercury Emissions from PMA-Catalyzed Polymer Floors: Investigations, Mitigation, and Education

Christina R. Bush, Marian Heyman, Carl Herbrandson, Tom Baughman, Mark Johnson Michigan Dept Community Health, Lansing MI, United States

Keywords: phenyl mercuric acetate, Tartan® floor, polyurethane floor, rubber floor, mercury vapors

Article Number

### The Use of TVOC In Conjunction With Individual Volatile Organic Compound Criteria To Create

**High Performance Indoor Spaces** 

Stephany I. Mason, Anthony Worthan

Air Quality Sciences, Inc., Marietta GA, United States

Keywords: VOCs, Certification/labeling, Risk, Standards, guidelines, codes, Green and sustainable

buildings

#### **Reducing Environmental Triggers Of Asthma In Schools**

Laura Oatman

Minnesota Department of Health, Port Isabel TX, United States

Keywords: asthma triggers, school-based intervention, inspection checklist,

#### **Application Of Zeolites For The Removal Of Indoor Air Pollutants**

Jan Gunschera, Tunga Salthammer, Doreen Markewitz, Volker Thole, Katrin Bokelmann, Annett Halbhuber, Gerhard Sextl

Fraunhofer WKI, Braunschweig, Germany

Keywords: zeolite, pollutants, adsorption, degradation, catalysis

#### The Indoor Air Quality Procedure in the ASHRAE Ventilation Standard For Commercial

**Buildings: Is It Needed? Is It Ready?** 

Mark J. Mendell, Michael G. Apte

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United

States

Keywords: energy, indoor contaminants

### Experimental study on the uptake factor of tungsten oxide particles resulting from a dropped storage container

Zhi Gao, Jianshun Zhang, Jerry G.A. Byington

Syracuse University, Syracuse NY, United States

Keywords: Standard procedure, Tungsten oxide particles, Dropped container, Uptake factor, Full-

scale chamber

## Thermal Stratification in the Interior Zone of Buildings with Under-Floor Air-Distribution Systems

Kisup Lee, Guangqing Xue, Zheng Jiang, Qingyan Chen

Purdue University, West Lafayette IN, United States

Keywords: Thermal gradient, Under-floor air distribution, Airflow,

### Three Types of Demand-Controlled Ventilation Logic in a Single Zone System with Transient Analysis

Xingbin Lin, Josephine Lau

University of Nebraska - Lincoln, Omaha NE, United States

Keywords: Demand-Controlled Ventilation, Control logic, Transient Model,

#### Review Of Air Cleaning Technologies In Ventilation System For Bio-aerosols

Article Number

Chunxiao Su, Josephine Lau University of Nebraska - Lincoln, Omaha NE, United States Keywords: air cleaner, bio-aerosol,, ventilation,, UV, filter

#### Formulation Of A Healthy House Index And Three Sub-indices

Malcolm Cunningham, Michael Keall, Michael Baker, Philippa Howden-Chapman BRANZ, Porirua City, New Zealand

Keywords: respiratory index, slips and falls, injury index, health and safety

## Optimization Of A Passive Sampling Method For Determination Of Airborne Naphthalene For Residential Indoor Air Monitoring

Amanda J. Wheeler, Phil Fellin, Henrik Li, Mark D. Gibson, Judy Read Guernsey, Leonora Marro, Huda Masoud, Keith Van Ryswyk, Roger Sutcliffe, Marie-Eve Heroux Health Canada, Water, Air and Climate Change Bureau, Ottawa ON, Canada Keywords: Indoor air quality, method development, analytical procedure, naphthalene, monitoring

#### Radon And Ventilation In Residential High-rise Buildings

Henry Slack, Jani Palmer U.S. EPA Region 4, Atlanta GA, United States

Keywords: radon from concrete, high-rise residential ventilation

### An integrated protocol and rating system to assess the performance of portable air cleaners for residential indoor environments

Zuraimi Sultan, Robert Magee, Gregory Nilsson, John Bradley National Research Council Canada, Institute for research in construction, Ottawa ON, Canada Keywords: Protocol, Portable air cleaner performance, Pollutants, Energy, Acoustic

#### German Guidelines For Schools - Was It Enough To Create A Healthy Environment?

Marcia T. Giacomini, Sabine Bach, Axel Pietsch, Jürgen Kura, Frank Riebel, Klaus-Reinhard Brenske, Jan Fiedler, Heinz-Joern Moriske Federal Environment Agency, Berlin, Germany Keywords: schools, guidelines, air pollutants,

#### Comparison Of Governmental Indoor Environmental Quality (IEQ) Policies

Josh R. Aldred, Mark Jackson

US Air Force Academy, US Air Force Academy CO, United States

Keywords: Indoor Environmental Quality, Government Policies, Chemical Sensitivity,

### Photocatalytic Coating Material For Resisting Mold/mildew Growth Under Visible Light Irradiation

Yao Gao, Jacqueline James

University of Miami, Civil, Arch., and Environmental Engineering, Miami FL, United States Keywords: photocatalytic gel, Mold/mildew resistance, Titanium Dioxide, Hydrogen Peroxide

Article Number

#### IAQ Study Of Schools In Relation To Flooring Types And Cleaning Processes

Anthony Worthan, Marilyn Black, Ken McIntosh Air Quality Sciences, Inc, Atlanta GA, United States

Keywords: VOCs, allergens, flooring, schools

#### Review And Update Of Naphthalene Exposures - Is This The Highest Risk VOC?

Stuart Batterman, Jo-Yu Chin, Chunrong Jia, Chris Godwin, Edith Parker, Tom Robins, Paul Max, Toby Lewis

University of Michigan, Ann Arbor MI, United States Keywords: Naphthalene, VOCs, Risk, Exposure, Mothball

### Seasonal Variation In Ambient Thermal Environment And Sleep Of The Elderly Living In The Nursing Homes

Kazuyo Tsuzuki, Tomonori Sakoi, Yoko Sakata

National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan Keywords: thermal environment, sleep, elderly people, nursing home, season

#### Traffic-Related Exposures of Children With Asthma Living Near

Highways: Methods to Assess Indoor and Outdoor Trends of Black Carbon, PM2.5 and Other Pollutants, and Preliminary Results

Stuart Batterman, Alan Vette, Gary Norris, Davyda Hammond, Ram Vendantham, Jonathan Thornberg, Jeff Portzer, Laprisha Vaughn, Tom Robins, Toby Lewis, All Members University of Michigan, Ann Arbor MI, United States

Keywords: diesel exhaust, exposure, mobile emissions, traffic, roads

### Research For Measurements Of Formaldehyde Using Highly- Sensitive Detector Tube In An Animal Anatomy Laboratory

Ai Nakamura, Kunitoshi Matsunobu, Yuichiro Kaifuku, Masahiko Wakayama, Hiroshi Katagiri GASTEC Corporation, R and D division 1, Kanagawa, Japan Keywords: measurements, occupational/industrial, field study,

#### A Profile of Biomass Stove Use in Sri Lanka and Associated Environmental Health Risks

Myles F. Elledge, Sumal Nandasena, Michael Phillips, Vanessa Thornburg RTI International, International Development Group, Research Triangle Park NC, United States Keywords: Cook stoves, Indoor Air Pollution, Biomass, Respiratory Disease, Public Policy

### Placing Free-standing Air Filters In Bedrooms Of Inner City Children With Asthma--Do They Make A Difference?

Liuliu Du, Stuart Batterman, Edith Parker, Chris Godwin, Jo-Yu Chin, Ashley O'Toole, Tom Robins, Wilma Brakefield-Caldwell, Toby Lewis, Henggen Shen, Xiaodan Ren University of Michigan, Ann Arbor MI, United States

Keywords: Indoor environment, asthmatic children, particulate matter, exposure, control

### Pollutant Distribution Study Of The 2-fan Enhanced Displacement Ventilation System In The Tropics

Qiaoyan Li, David Cheong, Weimeng Sun, Arsen Melikov

Article Number

National University of Singapore, Singapore, Singapore

Keywords: Enhanced displacement ventilation, Pollutant distribution, Tracer gas, Tropics,

Manikin

#### **Building Intake Of Ambient Fine And Ultrafine Particulate Matter**

Jing Qian, Behtash Tavakoli, Goodarz Ahmadi, Andrea Ferro

Clarkson University, Civil and Environmental Engineering, Potsdam NY, United States

Keywords: Particulate Pollutant, Ultrafine Particle, CFD Modeling, Multizone Modeling, Indoor Air

#### Dispersion Of Respiratory Droplets Due To Coughing In A Classroom With Displacement Ventilation

Lei Zhang, Yuguo Li

Department of Mechanical Engineering, the University of Hong Kong, Hong Kong, China

Keywords: Infection spread, Droplet transport, Displacement ventilation, Classroom environment

#### A Study Of Phthalate Concentration Distribution In Indoor Environment

Xinke Wang, Ying Xu, Geng Liu

Xi'an Jiaotong University, Department of Building Environment and Services Engineering, Xi'an,

China

Keywords: SVOC, phthalate, indoor air quality, model, CFD

#### Simultaneous Measurements Of Ultrafine Particles (UFP) And Fine Particle Mass

#### Concentrations (PM-2.5) Indoors In Two Large Gaming Casinos With Smoking

Wayne R. Ott, Viviana Acevedo-Bolton, Lance A. Wallace, Kai-Chung Cheng, Ruo-Ting Jiang, Neil

E. Klepeis, Phillip Dacunto, James Repace, Lynn M. Hildemann

Stanford University, Civil and Environmental Engineering, Stanford CA, United States

Keywords: ultrafine particles, fine particles, secondhand smoke, casinos, laser photometer

#### A New Mathematical And Experimental Study For Prediction Irradiance Field Of Upper-room Ultraviolet Germicidal Systems

Sai-li Wong, Waiyee Chan, Alvin C.K. Lai

City University of Hong Kong, Hong Kong, Hong Kong

Keywords: UVGI, air disinfection, bioaerosols, novel model

#### Dispersion Of Coughing Droplets In A High-speed Rail Cabin

Lei Zhang, Yuguo Li

Department of Mechanical Engineering, the University of Hong Kong, Hong Kong, China

Keywords: Infection spread, Droplet transport, Train cabin environment, CFD simulation

#### Indoor Air Quality In Rural Rwanda: Intersection Of Engineering, Health And Culture

Susan C. Doll

Appalachian State University, Boone NC, United States

Keywords: household stove testing, biomass fuel use, cookstove testing, fire-tending practices

#### Hypertension And Solid Fuel Use Among Women In Rural Guizhou, China

Article Number

Line W.H. Alnes, Kristin Aunan, Sveinung Berntsen, Zeqin Dong, Heidi E.S. Mestl CICERO Center for International Climate and Environmental Research, Oslo, Norway Keywords: Solid Fuel Use, Hypertension, rural China, residential

#### A lumped parameter method to determine emission parameters of DEHP in PVC floorings

Cong Liu, Yinping Zhang, Lixin Wang, Mengyan Gong

Tsinghua University, Beijing, China

Keywords: Lumped parameter method, emittabl initial concentration, DEHP, Semi-volatile organic compounds (SVOCs), Indoor air quality

### Numerical Study On The Influence Of Moisture Buffering Effect And Energy Impact Of Interior

Materials In Hot And Humid Climates

Yaw-Shyan Tsay, Che-Ming Chiang, Yu-Chun Yeh

National Yunlin University of Science and Technology, Creative Design, Yunlin, Taiwan

Keywords: moisture buffering effects, ventilation, numerical simulation,

#### Airflows In A Large Opening In A Naturally Ventilated Building

Jeong-Sik Seo, Yong-Hyun Kim, J. S. Park

Hanyang University, Seoul, Korea, Republic of

Keywords: Natural ventilation, Infiltration, Mock-up test, Large opening

#### A Kind Of New Constant Emission Rate Reference Sample For Toluene And Benzene

Wenjuan Wei, Jianyin Xiong, Yinping Zhang

Tsinghua University, Beijing, China

Keywords: Indoor air quality (IAQ), volatile organic compounds (VOC), emission sample,

chamber, furniture

#### An experiment study on people's adaptability between people used to different environment

Juan Yu, Yingxin Zhu, Qin Ouyang, Guoguang Cao, Weilin Cui, Henggen Shen

Tsinghua University, Beijing, China

Keywords: thermal comfort, thermal adaptability, psychological acclimatization, skin

temperature, heart rate variability

#### Norwegian guidelines for particle-exposure in IAQ-investigations: mould and dust levels

Johan Mattsson, Ole Erik Carlson, Kolbjørn M. Jenssen

Mycoteam, Oslo, Norway

Keywords: Mould, IAQ, Airsampling, Dustparticles, Exposure

#### Redevelopment measures in public buildings in Cologne, Gemany

Gudrun Barth, Christof Kaesler, Gerhard A. Wiesmüller

Cologne Public Health Departement, Cologne, Germany

Keywords: Active health care, indoor air pollution, indoor air quality, room acoustics, drinking

water hygiene

#### Activation of Nociceptive Transient Receptor Potential Channels by Texanol and TXIB

Article Number

Toshiko Tanaka-Kagawa, Susumu Ohkawara, Yoko Furukawa, Tetsuji Nishimura, Hideto Jinno National Institute of Health Sciences, Division of Environmental Chemistry, Setagaya-ku, Japan Keywords: indoor air pollutants, sick-building syndrome, airway chemosensation, irritation

#### Mixed-mode Buildings: A Double Standard In Comfort

Max Deuble, Richard de Dear

Macquarie University, Department of Environment and Geography, North Ryde, Australia

Keywords: Thermal comfort, Mixed-mode ventilation, Comfort standards,

#### Impact of Intermittent Indoor Climate Conditions on Productivity of the Occupants

Rokas Valancius, Andrius Jurelionis

Kaunas University of Technology, Faculty of Civil Engineering and Architecture, Kaunas, Lithuania

Keywords: work performance, unsteady air temperature, laboratory tests,

#### How To Improve Energy Efficiency Of Building Stock In The European Union

Krzysztof Klobut, Pekka Tuominen, Anne Tolman, Afi Adjei, Marjolein de Best-Waldhober

VTT Technical Research Centre of Finland, Espoo, Finland

Keywords: Potential for energy savings, decisions on energy savings, Energy Performance

Certificate, barriers for energy savings, state policies

#### Indoor Environmental Quality Surveys. A Brief Literature Review

Clara Peretti, Stefano Schiavon

DFT Department of Technical Physics, Padova, Italy

Keywords: Post-occupancy evaluation, Occupant survey, Indoor Environment Evaluation,

Questionnaire

#### Visible Light Photocatalytic Oxidation Of Indoor Volatile Organic Compounds

Zhenan Han, Victor Wei-Chung Chang, Ooi Kiang Tan, Man Siu Tse

Nanyang Technological University, School of Civil & Environmental Engineering, Singapore,

Singapore

Keywords: Photocatalyst, Ball-milling, Spray-coating,

#### Effects of Mouth Coverings on Co-occupant's Exposure under Different Ventilation Systems

Xiaoping Li, Jianlei Niu

The Hong Kong Polytechnic University, Hong Kong, China

Keywords: Physical intervention, infectious disease transmission, health exposure, ventilation

methods

#### Direct Mass Determination Of Ultrafine Aerosols Using A Micro-scale Sensor

Erik Uhde, Erwin Peiner, Ina Kirsch, Hutomo Suryo Wasisto, Stephan Merzsch, Andreas Waag Fraunhofer WKI, Material Analysis & Indoor Chemistry, Braunschweig, Germany

Keywords: Measurements, Ultrafine particles, MEMS,

#### A Model Of Passive Diffusive Sampler For Determining Indoor VOC Exposure

Xinxiao Li, Qiujian Xu, Yinping Zhang, Jinhan Mo

**Article** Number

Tsinghua University, Beijing, China

Keywords: Indoor air quality (IAQ), Volatile organic compound (VOC), Exposure, Passive diffusive sampler

### Measurement Of Cleaning Effectiveness In School Buildings: Evaluation Of A Candidate

#### **Standard Method**

Eugene Cole, Richard Shaughnessy, Ulla Haverinen-Shaughnessy, Keith Leese

University of Tulsa, Tulsa OK, United States

Keywords: schools, measurement, cleanliness, ATP, standard

#### Thermal Comfort In Office Buildings With Large Window Surfaces

László Kajtár, János Szabó

Budapest University of Technology and Economics, Department of Bulding Service and Process

Engineering, Budapest, Hungary

Keywords: office building, huge window surface, thermal comfort, measurement

#### Emission and uptake of gas phase di(2-ethylhexyl)phthalate by floor dust

Vivi Kofoed-Sørensen, Per Axel Clausen, Anni Vibenholt, Peder Wolkoff

NRCWE, Copenhagen Ø, Denmark

Keywords: sorption, settled dust, SVOC, FLEC

#### **Energy And Environmental Evaluation Of A Residential Building Before And After Complex** Renovation

Hana Pustayová, Dušan Petráš

Faculty of civil engineering, Technical University of Slovakia, Bratislava, Slovakia

Keywords: energy performance, thermal comfort, thermal discomfort, energy efficiency

measures, PMV and PPD indices

#### A Pilot Study Of Prevalence Of Lead-based Paints And Lead Contaminated Dust In French Schools

MICKAEL DERBEZ, Claire DASSONVILLE, Murielle LETHROSNE, Philippe BRETIN, Severine **KIRCHNER** 

Université Paris Est - CSTB, Champs sur Marne, France

Keywords: school, lead, settled dust, children exposure

#### Co-cultivated Damp Building Related Microbes Trigger Oxidative Stress Inducing Cytotoxicity,

#### **DNA damage and Inflammation in Macrophages**

Piia Markkanen, Jukka Pelkonen, Jorma Mäki-Paakkanen, Maija-Riitta Hirvonen

National Institute for Health and Welfare, Kuopio, Finland

Keywords: microbial interactions, cell death, genotoxicity, inflammation, in vitro

#### Inter-laboratory Study To Check The Performance Of Test Chamber Measurements For Product

#### **Emission Testing**

Olaf Wilke, Wolfgang Horn, Katharina Wiegner

BAM Federal Institute for Materials Research, Berlin, Germany

Keywords: Emission test chamber, Product emission testing, VOC-emission, Round robin test

Article Number

### Identification Of Anthropogenic Odor Active Compounds Causing Bad Air Quality In Highly Occupied Rooms

Andrea Burdack-Freitag, Florian Mayer, Klaus Breuer

Fraunhofer Institute for Building Physics, Valley, Germany

Keywords: VOC, anthropogenic odors, perceived air quality, gas chromatography-olfactometry,

odor intensity

## Validation of an EDP-supported model for assessing inhalation exposure during indoor spraying processes

Edith Berger-Preiss, Wolfgang Behnke, Heiko Kock, Wolfgang Koch, Susanne Gerling, Katrin Schröder

Fraunhofer Institute for Toxicology and Experimental Medicine, Bio- and Environmental Analytics, Hannover, Germany

Keywords: Exposure assessment, Inhalation, Biocides, Model, Field study

### Cumulative Indoor Exposures To Semi-volatile Organic Compounds (SVOCs) In France: The ECOS Project

Philippe Glorennec, Fabien Mercier, Olivier Blanchard, Nathalie Bonvallot, Olivier Ramalho, Corinne Mandin, Barbara Le Bot

EHESP - School of Public Health, Environmental and occupational health, Rennes, France

Keywords: environmental exposure, public health, indoor air, dust

#### **Assessment Of Lighting Conditions For Older Adults In Dutch Nursing Homes**

Joost van Hoof, Marianne M. Sinoo, Helianthe S.M. Kort

Utrecht University of Applied Sciences, Research Centre for Innovation in Health Care, Utrecht, Netherlands

Keywords: low vision, illuminance, colour temperature, daylight, health care

### Evaluation Of Indoor Climate In Office Building In Bratislava - In Summer And Also In Winter Period

Emilia Durišová, Dušan Petráš

Faculty of Civil engineering, The Slovak University of Technology, Slovakia, Department of building services, Bratislava, Slovakia

Keywords: evauation, indoor climate, measurements, low exergy system

#### Evaluation of thermal comfort and energy conservation of heat pump desiccant systems

Yuka Ishikura, Susumu Horikawa, Tatsuya Hayashi, Shigeo Mitsuno, Satoshi Uchida, Mari Yamamoto, Naoe Nishihara, Shin-ichi Tanabe

Waseda University, Tokyo, Japan

Keywords: Energy conservation, Thermal comfort, Performance, Desiccant, Subjective experiment

#### Hand-operated Natural Ventilation Windows of Skyscraper Building

Yuko Iwahashi, Shin-ichi Tanabe, Jeongsoo Kim, Tomomi Kawaguchi, Ken-ichi Yasuda Waseda University, Tokyo, Japan

Article Number

Keywords: Actual operation, Enlightenment activity, Energy conservation, Double-skin, BEMS

### Field Measurement On Thermal Environment In Open-plan Elementary School With Natural Ventilation Window

Koji Hamasaki, Kosuke Kawada, Jeongsoo Kim, Katsuhiko Mori, Miki Fujino, Shin-ichi Tanabe

Waseda University, Tokyo, Japan

Keywords: Natural ventilation, Elementary school, Open-plan, Field measurement

### Investigation Into The Cytotoxic, Genotoxic And Proinflammatory Effects Of Laser Printer Emissions In Human Epithelial A549 Lung Cells

Volker Mersch-Sundermann, Tao Tang, Richard Gminski, Mathias Könczöl, Rebecca Kuhn, Christoph Modest, Benedit Armbrust, Carsten Gründemann
Department of Environmental Health Sciences, Freiburg, Germany
Keywords: particulate matter, VOCs, WST-1, micronuclei test, cytokines

### The Effects Of Housing Conditions And Outdoor Air On Characteristics Of Indoor Air Particulate Matter: Toxicological Characterization Of PM Size Fractions

Ari Markkanen, Kari Kuuspalo, Mika Komppula, Jorma Jokiniemi, Kari Lehtinen, Jukka-Pekka Männikkö, Piia Markkanen, Teija Meklin, Maija-Riitta Hirvonen University of Eastern Finland, Department of Environmental Sciences, Kuopio, Finland Keywords: Residential, Measurements, In vitro, Toxicology, Inhalation

### Simulation of psychological responses in car cabin with alternation of the wind direction of the air conditioning

Yuji Mori, Shin-ichi Yoshimura, Hajime Oi, Shin-ichi Tanabe WASEDA university, Tokyo, Japan

Keywords: In vehicles, Numerical thermoregulation model, CFD, Zhang model

### Concentrations Of Indoor Air Pollutants In Irish And Scottish Homes Where Open Combustion Takes Place

Sean Semple, Carole Garden, Marie Coggins, Karen S. Galea, Paul Whelan, Hilary Cowie, Fintan Hurley, Jon G. Ayres

University of Aberdeen, Aberdeen, United Kingdom

Keywords: indoor air quality, domestic homes, smoking, impact on health, solid fuel

## Studies on the Formation of DNA-protein Crosslinks in Rat Marrow Cells Induced by Liquid and Gaseous Formaldehyde

Wang Kun, Yang Xu, Zhou Yanqing, Ding Shumao, Esheng Zhou Huazhong Normal University, College of Life Sciences, Wuhan, China Keywords: Formaldehyde, Leukemia, Genotoxicity, Marrow cells, DNA-protein crosslinks

#### Airflow And Indoor Air Quality Analyses Capabilities Of Energy Simulation Software

Lisa C. Ng, Andrew K. Persily NIST, Gaithersburg MD, United States

Article Number

Keywords: Energy simulation, Airflow simulation, Contaminant transport, IAQ analyses

### VOC Emissions from building materials accompanying sensory tests for different evaluation schemes

Wolfgang Horn, Birgit Müller, Oliver Jann, Jana Panašková, Dirk Müller, Wolfgang Plehn BAM Federal Institute for Materials and Testing, Berlin, Germany Keywords: odor, voc, evaluation,

#### **VOC-Emissions from Plywood Boards**

Olaf Wilke, Katharina Wiegner, Harald Scheffer, Doris Broedner Federal Institute for Materials Research, Berlin, Germany Keywords: VOC emission, Plywood, Terpenes, Aldehydes, Indoor Air Quality

### Simultaneous Removal of Formaldehyde and Ozone By Noble Metal Modified $TiO_2$ Film In The

#### **VUV Photocatalytic Process**

Pingfeng Fu, Pengyi Zhang, Jia Li Tsinghua University, Beijing, China Keywords: Vacuum Ultraviolet, Photocatalysis, Formaldehyde, Ozone, Noble metal nanoparticles

### Thirdhand Smoke In The Indoor Environment: Heterogeneous Nicotine Oxidation And

**Secondary Organic Aerosol Formation** Lauren M. Petrick, Yael Dubowski

Technion, Haifa, Israel

Keywords: FTIR-ATR, SOA, indoor surfaces, ozone, personal exposure

#### Speciation Of SOA From Limonene Oxidation Indoors Using A Detailed Chemical Model

Nicola Carslaw

University of York, Environment, York, United Kingdom

Keywords: indoor air chemistry, chemical box model, limonene-ozone-SOA,

#### **Assessment and Remediation of Corrosive Drywall**

Ed Light

Building Dynamics, LLC, Ashton MD, United States

Keywords: building investigation, corrosion, irritants, residential, sulfides

### Housing and Health from the Points of view of Type of Residential area, Residence, and

#### Tenancy

Maria Pekkonen, Mari Turunen, Ari Paanala, Ulla Haverinen-Shaughnessy National Institute for Health and Welfare, Kuopio, Finland Keywords: Housing and health, Residential area, Building type, Tenure status

#### How To Assess Exposure To Home Molds In An Epidemiological Study?

Dorothée GRANGE, Edouard CHATIGNOUX, Cécile SOMMEN, Murielle DUSSEAUX, Valérie BEX-CAPELLE, Stéphane MOULARAT, Enric Robine, Isabelle GREMY, Sabine HOST Observatoire régional de santé Ile-de-France, PARIS, France

**Article** Number

Keywords: fungi, ergosterol, MVOC, mycotoxins, measurement

#### **Moisture Management During the Construction Process**

Ed Light, James Bailey, Roger Gay

Building Dynamics, LLC, Ashton MD, United States

Keywords: mold, damp buildings, remediation, bioaerosols, building investigation

#### **Beyond Green - Buildings Tailored For People**

Diotima von Kempski

DVK air vitalizing system, Düsselorf, Germany

Keywords: perception, wellbeing, senses, natural indoor air, productivity

#### Measurements of Indoor Environmental Quality and Energy Performance of six European Zero

#### Carbon Houses - a Case Study from the First House

Peter Foldbjerg, Lone Feifer, Ellen Kathrine Hansen, Karsten Duer

VELUX A/S, Hørsholm, Denmark

Keywords: Healthy homes, Residential, Field studies, Energy, IEQ

#### Comparison of Heat Input between Floor Heating and Forced Air Systems Based on Thermal

#### **Comfort for Different Thermal Insulation Levels**

Tomoyuki Yokoyama, Toshiaki Omari, Shin-ichi Tanabe, Yumiko Takahashi

Waseda University, Tokyo, Japan

Keywords: Thermal comfort, Thermal manikin, Heat loss coefficient, Heating systems, CFD

### Health Effects of Combined Exposure to Diesel Particles and Traffic Noise - a Methodology for

#### **Controlled Chamber Study**

Aneta Wierzbicka, Maria Albin, Anna Axmon, Lars Barregård, Margareta Berglund, Mats Bohgard, Jonas Brunskog, Inger Hagerman, Bo A. Jönsson, Kai Österberg, Torben Poulsen, Jenny Rissler, Gerd Sällsten, Yivi Xu, Anders Gudmundsson, Ulla B.K. Andersson, Eva Assarsson, Karin Broberg, Anna-Therese

Gunnskog, Monica Kåredal, Patrik Nilsson, Joakim Pagels, Leo Stockfelt

Ergonomics and Aerosol Technology, Lund University, Lund, Sweden

Keywords: human exposure, diesel exhaust, traffic noise, health effects, laboratory study

#### A statistical approach to determining the uncertainty in power-law model estimates of

#### emissions based on time-dependent chamber concentration measurements

David Marr, Mark Mason, Leonard Stefanski

US EPA, RTP NC, United States

Keywords: Product Emissions, Statistics, Emissions Modeling, Chamber Testing

#### Study of a Personal Environmental Control System Using Opposing Airstreams

Chonghui Liu, Hiroshi Higuchi, Edward Arens, Hui Zhang

C&S Companies, Facilities Group, Syracuse NY, United States

Keywords: Laboratory studies, Ventilation, Comfort, Personal ventilation

Article Number

## Benefits of Using Online Training To Provide Home Environmental Assessment Education For Health Care Professionals

Kathleen G. Norlien, Laura Oatman

Minnesota Department of Health, Asthma Program, St. Paul MN, United States

Keywords: Asthma, Reducing environmental asthma triggers, Home assessments, Online training,

Residential

### Study On The Passive Design Of The Moisture Buffering Layer For The Typical Residential Building In Taiwan

Yu-Chun Yeh, Yaw-Shyan Tsay, Che-Ming Chiang, You-Ling Lo

National Cheng Kung University, Architecture, Tainan City, Taiwan

Keywords: Moisture Buffering Material, Ventilation, Interior Design, Residential Building in

Taiwan

### Methodology To Establish A Kinetic Law For Real Operating Conditions Of A Photocatalytic Process For Indoor Air Treatment

Audrey MAUDHUIT, Cécile RAILLARD, Valérie HEQUET, Laurence LE COQ, Jean SABLAYROLLES, Laurent MOLINS, Aurelie Joubert

Ecole des Mines de Nantes, Nantes, France

Keywords: Indoor Air Quality (IAQ), Dynamic photocatalytic reactor, Volatile Organic

Coumpounds (VOCs), Experimental design, Kinetic models

### Elemental Mercury Emission In The Indoor Environment Due To Broken Compact Fluorescent Light (CFL) Bulbs

David Marr, Mark Mason, Stanley Durkee

US EPA, RTP NC, United States

Keywords: Mercury, Emissions, Energy Use, Lighting

#### **Cumulative Indoor Exposures To Semi-volatile Organic Compounds (SVOCs) In France:**

#### **Contamination Levels Of SVOCs In Thirty French Schools**

Fabien Mercier, Gaëlle Raffy, Mickaël Derbez, Philippe Glorennec, Olivier Blanchard, Nathalie Bonvallot, Le Bot Barbara

EHESP, Rennes, France

Keywords: child environmental exposure, public health, indoor air, settled dust

### Identifying Sources Of Volatile Organic Compounds And Aldehydes In A High Performance Building

Randy Maddalena, Anna C. Ortiz, Wen-Yee Lee, Marion Russell, Joshua S. Apte, Michael G. Apte Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United States

Keywords: Building materials, Emissions testing, Source characterization,

#### **Method Validation Study For Voc Emission Measurements**

Wolfgang Horn, Katharina Wiegner, Olaf Wilke, Oliver Jann

BAM Federal Institute for Materials Research and Testing, Berlin, Germany

Keywords: Measurements (detection, identification, quantific, Certification/labeling, VOCs,

Article Number

### Semi-volatile Organic Compounds (SVOCs) in dust samples: What About The Storage Conditions?

Olivier Blanchard, Fabien Mercier, Barbara Le Bot, Corinne Mandin, Olivier Ramalho, Philippe Glorennec

EHESP - School of Public Health, Rennes, France

Keywords: Indoor Environment, Settled dust, House dust, Standard Reference Material

#### A Study On Thermal Resistance Of Clothing Under Cross Ventilated Situation

Nobumi Sahashi, T. Kurabuchi, T. Ogasawara, K. Sato, S. Ikehara,

M. Ohba, S. Iwamoto

Tokyo University of Science, Tokyo, Japan

Keywords: thermal manikin, thermal resistance of clothing, convective heat transfer coefficient,

### Differences In Tear Film Break Up Time (NIBUT And SBUT) Between Workers In Old Brick Buildings And In An Old Wooden Building

Jan Vilhelm Bakke, Bente E. Moen, Dan Norbäck, Gunilla Wieslander

Arbeidstilsynet (The Norwegian Labour Inspection Authority), Gjøvik, Gjøvik, Norway

Keywords: Epidemiology, Field studies, Irritation, Tearfilm Break-up Time, Symptomatology

#### Chemical Emissions From Personal Computer And Printers Using Test Chamber Method

Dong-won Yoon, Hyo-Jun Kim, Sung-Min Hong, Nam-Chul Sung

Kyungwon University, Sungnam, Korea, Republic of

Keywords: Test Chamber method, Chemical Emission, VOCs and Formaldehyde, Printer and Hard

copy

### Associations between parental reports of doctor-diagnosed asthma and allergy among Danish children and their family habits and dwelling characteristics

Jorn Toftum, Gabriel Bekö, Geo Clausen, Michael Callesen, Arne Høst, Carl-Gustaf Bornehag, Jan Sundell, Torben Siggsgaard

Technical University of Denmark, Civil Engineering, Lyngby, Denmark

Keywords: Questionnaires, epidemiology, field study, risk factors

### Estimates of Shelter-in-Place Effectiveness: How Important is Outdoor Concentration Fluctuation?

Wanyu R. Chan, Michael M. Sohn

Lawrence Berkeley National Laboratory, Berkeley CA, United States

Keywords: Toxic load, acute health effects, indoor-outdoor exposure, chemical release accidents

#### **Ventilation Measurements In IAQ Studies: Problems And Opportunities**

Andrew Persily, Hal Levin

NIST, Gaithersburg MD, United States

Keywords: experimental design, field studies, measurement methods, study design

## Application of Passive Flux Sampler for measurement of formaldehyde emission rates in indoor environments

Article Number

Herve Plaisance, Alodie Blondel

Ecole des Mines de Douai, Douai, France

Keywords: formaldehyde, building and furniture, indoor sources, passive sampling, mass balance

model

## Factors Affecting Variations In Indoor Particle Concentrations At An Urban Commercial Building In Close Proximity To Mobile Emissions

Collin M. Work, Andrea R. Ferro

Clarkson University, Civil and Environmental Engineering, Potsdam NY, United States

Keywords: ultrafine particles, size distribution, I/O ratio, freeways, black carbon

### Attribution to Trigger Factors in Sick Building Syndrome And Multiple Chemical Sensitivity- "the Vasterbotten Environmental Health Study".

Anna-Sara Claeson, Eva Palmquist, Linus Andersson, Berndt Stenberg, Steven Nordin

Department of psychology, Umeå, Sweden

Keywords: sick building syndrome, multiple chemical sensitivity, trigger factor, questionnaire

### Comparison Of Paris Area Inhabitants' Exposure To Atmospheric Pollution According To Six Means Of Transportation

Hanitriniala Ravelomanantsoa, Claudine DELAUNAY, Ghislaine GOUPIL, Sophie MAZOUE Laboratoire d'Hygiène de la Ville de Paris, Paris, France

Keywords: transport-related pollution, car, public transport, soft mobility modes, gas and particles

### Indoor Environment And Sick Building Syndrome (SBS) Symptoms In Offices Of A University In Singapore

Ailu Chen, Victor Chang

Nanyang Technological University, Division of Environmental and Water Resources Engineering, Singapore, Singapore

Keywords: Sick Building Syndrome, Thermal comfort, Offices, Indoor air quality, thermal adaptation

#### Impact Of Co<sub>2</sub> On Human Decision Making And Productivity

Usha Satish, William J. Fisk, Mark J. Mendell, Krishnamurthy Shekhar, Lisa B. Cleckner, Kailing Teng, Katia Eliseeva, Toshifumi Hotchi, Douglas Sullivan SUNY Upstate Medical University, Syracuse NY, United States

Keywords: Productivity, IAQ, Decision Making, Performance

### Protection Of Office Workers From Exposure To Respiratory Diseases By A Novel Ventilation System

Guangyu Cao, Jorma Heikkinen, Helena Järnström Technical Research Centre of Finland (VTT), Espoo, Finland Keywords: novel ventilation, infection, healthy, productivity

On The Associations Of Fungal Levels In Child Care Centers With Wheeze And Rhinitis Symptoms Among Attending Preschool Children.

Article Number

Zuraimi M. Sultan, Kwok- Wai Than, Lei Fang, Teck-Koon Tan, Carl-Gustaf Bornehag, Jan Sundell National Research Council Canada, Ottawa ON, Canada

Keywords: Fungi, asthma and allergies, epidemiology, exposure

#### An Air Cleaner Effectiveness Approach To The Analysis Of In-duct UVGI Systems

Joseph Firrantello, William Bahnfleth Penn State University, UNIVERSITY PARK PA, United States Keywords: Models, Contaminants

Incorporating Climate Change And Indoor Air Quality Considerations Into Building Design

Vivian E. Loftness

Carnegie Mellon University, Pittsburgh PA, United States

Keywords: Climate change, architecture

#### Determination of formic and acetic acids in air

Katharina Wiegner, Oliver Hahn, Farke Matthias, Sabine Kalus, Wolfgang Horn Federal Institute for Materials Research and Testing, Working Group IV.26, Berlin, Germany Keywords: VOCs, detection of formic and acetic acid, quantification of formic and acetic acid, air sampling

#### Assessing the Shelf-life of a Prototype Reference Material for Product Emissions Testing

Cynthia Howard-Reed, Zhe Liu, Steve Cox, Dan Samarov, Dennis Leber, John Little National Institute of Standards and Technology, Gaithersburg MD, United States Keywords: volatile organic compounds, test method validation, product certification,

#### The Northeast Indiana Community Environmental Health Initative

Lara Lasky, Jack Barnette, Elizabeth McWhorter
U.S. EPA Region 5, Air & Radiation Division, Chicago IL, United States
Keywords: healthy homes, community based, wholistic approach, federal state local
partnerships, engaging businesses

### Efficacy Of Structural Pasteurization For Reduction Of Viable Bacterial Levels In Indoor Environments

Sean P. Abbott, Larry Chase, M. Chance Villines Natural Link Mold Lab, Inc., Reno NV, United States

Keywords: Microbial Contamination, Thermal Death Point, Heat, Sewage, Remediation

### A Comparative Study Of Estimating Particle Resuspension Rate Using A Consistent Test Mechanism

Yilin Tian, Kyung Sul, Cynthia Howard-Reed, Dennis Leber, Andrea Ferro Clarkson University, Institute for a Sustainable Environment, Potsdam NY, United States Keywords: Inhalable particle, Particle resuspension, Mechanical foot,

Tracer-gas Technique As A Surrogate Method For Tracking Airborne Pathogen Transport In Indoor Environments

Article Number

M. Alonso Camargo-Valero, Carl A. Gilkeson, Catherine J. Noakes University of Leeds, School of Civil Engineering, Leeds, United Kingdom Keywords: bioaerosol, carbon dioxide, hospital ward, natural ventilation

### Using Human Activity Patterns To Estimate The Impact of Different Flooring Types On Total Average PM 2.5 Exposures

Lisa D. Bramwell, Steven Foti, Sumona Mondal, Andrea R. Ferro Clarkson University, Civil and Environmental Engineering, Potsdam NY, United States Keywords: PM 2.5, Exposures, CONTAM, Flooring Types

#### Indoor Air Related Symptoms And Risk Factors In School And Kindergarten Employees

Knut R. Skulberg, Britt Ann K. Høiskar, Oddbjørn Sjøvold, Knut Skyberg Norwegian Federation of Asthma and Allergic Diseases, Oslo, Norway Keywords: Schools, Human subjects, Irritation,

#### Reducing Chemical Exposure To Protect Children's Health - Furniture And Bedding Case Studies.

Barry Cik, Ranee Valles, Brian C. Englert GREENGUARD Environmental Institute, Atlanta GA, United States Keywords: Bedding, Certification, Standards, Products, Risk Management

#### **Automobile Proximity And Indoor Residential Concentrations Of BTEX And MTBE**

Diana Hun, Richard Corsi, Maria Morandi, Jeffrey Siegel Oak Ridge National Laboratory, Building Envelopes Research, Oak Ridge TN, United States Keywords: Attached garages, Benzene, Exposure, Gasoline, RIOPA

#### Microbiological Air Quality at Sanatorium

Rafal L. Górny, Krzysztof Fraczek

Central Institute for Labour Protection – National Research Institute, Department of Chemical and Aerosol Hazards, Warsaw, Poland

Keywords: health resort, air quality, bioaerosols, treatment procedures, building air-tightness

#### Validation Of Lagrangian Particle Modeling For Indoor Pollutant Transport Analysis

Donghyun Rim, Atila Novoselac

National Institute of Standards and Technology, Gaithersburg MD, United States Keywords: Indoor particles, Lagrangial modelling, Transport, Deposition, Uncertainty

### Multidisciplinary Approach To IEQ Pesticide Evaluations

**In Schools: Science And Perceptions** 

Elissa A. Favata, MD, Michael McGuinness

R.K. Occupational & Environmental Analysis, Inc., Phillipsburg NJ, United States

Keywords: indoor air quality, pesticides, multidisciplinary investigations, perceptions of

contamination, exposure pathways

Air Cleaners And Changes Of Indoor Air Quality And Health-an Intervention Study

Article Number

Knut R. Skulberg, Bente Hellum, Oddbjørn Sjøvold

Oslo University College, Oslo, Norway

Keywords: Field studies, Particles, Air cleaning, Irritation

#### Meeting The Challenge Of Reducing VOC Product Emissions: A 20 Year Review.

Brian C. Englert, Marilyn Black

GREENGUARD Environmental Institute, Suite 110, Atlanta GA, United States

Keywords: VOCs, Certification, Standards, Products, Risk Management

#### Indoor Hygrothermal Conditions In Estonian Old Multi-storey Brick Apartment Buildings

Targo Kalamees , Simo Ilomets, Endrik Arumägi, Üllar Alev, Teet-Andrus Kõiv, Alo Mikola, Kalle Kuusk, Mikk Maivel

Tallinn University of Technology, Chair of Building Physics and Architecture, Tallinn, Estonia Keywords: Indoor climate, temperature, humidity, moisture excess, multi-storey apartment buildings

### Modeling Of Ventilation Rates In Bedrooms Based On Building Characteristics And Occupant Behavior

Gabriel Bekö, Jørn Toftum, Geo Clausen

ICIEE, BYG, Technical University of Denmark, Lyngby, Denmark

Keywords: Air change rate, Carbon dioxide, Homes,, Linear regression model

### Use Of Hydrocarbon Fingerprinting To Identify Major Sources Of Volatile Petroleum Hydrocarbon Compounds In Indoor Air

Thomas McHugh, Shawn Paquette, William Elcoate, Fiorenza Stephanie, Danielle Bailey, Lila Beckley

GSI Environmental, Houston TX, United States

Keywords: indoor air quality, petroleum, hydrocarbons, fingerprinting, vapour intrusion

### Comparison Of Air Change Rates Obtained By Different Ventilation Measurement Techniques In Five Danish Homes

Gabriel Bekö, Sine Gustavsen, Marie Frederiksen, Barbara Kolarik, Jørn Toftum, Geo Clausen ICIEE, BYG, Technical University of Denmark, Lyngby, Denmark

Keywords: Air change rate, Carbon dioxide, Homes, Linear regression model

#### Worker And Patron PM2.5 Exposures In A California Casino With Smoking

Neil Klepeis, Viviana Acevedo-Bolton, Ruoting Jiang, Kai-Chung Cheng, Wayne Ott, James Repace, Lynn Hildemann

Stanford University, Aromas CA, United States

Keywords: Secondhand smoke, Environmental Tobacco Smoke, Real-Time Monitoring, Fine Particles, Exposure Monitoring

### Reductions in Residential Wood Smoke Concentrations and Infiltration Efficiency using Electrostatic Air Cleaner Interventions

Amanda J. Wheeler, Mark Gibson, Tony J. Ward, Ryan Allen, Judy Read Guernsey, Matt Seaboyer, James Kutcha, Richard Gould, David Stieb

Article Number

Dalhousie University, Community Health and Epidemiology, Halifax NS, Canada Keywords: Indoor air pollution, PM2.5, wood burning emissions, recursive model, wood smoke tracer

### Air Pollutant Exposure Assessment In Texas Urban Areas Using A Geographic Information System

YUAN YUAN, Tanvir Khan, David Ramirez, Carmen Ramos, Hua Li Texas A&M University-Kingsville, Kingsville TX, United States Keywords: Geographic Information System, Urban pollution, environmental disparities, ultrafine particles, traffic emission

#### Studies On The Efficacy Of Airborne Microbial Inactivation By The Air Purifier

Yoshio OKAMOTO, Kenkichi KAGAWA, Junichirou ARAI DAIKIN Industries, Itd., kusatsu, SHIGA, Japan

Keywords: air purifier, airborne microorganism, inactivation, atreamer discharge

## Field measurements of seasonal changes in Air Change rate and spatial distribution of gaseous pollutants in five Danish homes

Sine Gustavsen, Gabriel Bekö, Jørn Toftum, Geo Clausen

International Centre for Indoor Environment and Energy, Technical University of Denmark, Kgs. Lyngby, Denmark

Keywords: Active tracer gas, Occupied residences, Real time measurements,

### Air Change Effectiveness in Laboratory Tests of Combined Chilled Ceiling and Displacement Ventilation

Stefano Schiavon, Fred Bauman, Brad Tully, Julian Rimmer

University of California, Berkeley, Berkeley CA, United States

Keywords: Ventilation effectiveness, Contaminant stratification, displacement ventilation, Air temperature stratification, Radiant ceiling panel

### Prediction Of Indoor Air Quality and Energy Consumption Considering Dweller's Opening Behavior Based On The Measurements On The Opening Habit In Houses

Motoya Hayashi, Yoshinori Honma, Masanori Sugawara

Mlyagigakuin Women's University, Sendai, Japan

Keywords: Formaldehyde, Carbon dioxide, Ventilation rate, Opening width, Simulation

#### Study Of Ozone Emission And IAQ In Computer Laboratory

Adnan Husain, Mohamad Zainal Yusof, Abdul Mutalib Leman, Nurul Zakiah Zamri, Baizura Aini Azizi

University of Tun Hussein Onn Malaysia (UTHM), Department of Aeronautical Engineering, Batu Pahat, Johor, Malaysia

Keywords: Walk-in Stability Chamber, WiSC, Ozone Emission,

## **Energy-efficient Indoor Volatile Organic Compound Air Cleaning Using Activated Carbon Fiber Media With Nightly Regeneration**

Meera A. Sidheswaran, Douglas Sullivan, Hugo Destaillats, William Fisk, Sebastian Cohn

Article Number

Lawrence Berkeley National Laboratory, Berkeley CA, United States Keywords: activated carbon fiber, thermal regeneration, ventilation energy savings, volatile organics, air cleaning

#### Solving FEMA's Temporary Housing Unit Formaldehyde Issue

Nate Sanders, Tony Worthan, Scott Laughlin, Allyson McFry
Air Quality Sciences - Building Consulting, Marietta GA, United States
Keywords: VOCs, material sources/emissions, healthy homes, buildings and communitites

#### **Active And Passive Methods For Indoor Formaldehyde Elimination**

Meera A. Sidheswaran, Doug A. Sullivan, Hugo Destaillats, William J. Fisk, Sebastian Cohn, Joern Larsen

Lawrence Berkeley National Laboratory, Berkeley CA, United States

Keywords: manganese oxide, formaldehyde, indoor air cleaning, room temperature catalysis

### Modeling of UV Irradiance Field in Computational Fluid Dynamics to Study Effectiveness of Upper-Room Ultraviolet Germicidal Irradiation Lamps in a Patient Room

Mohammad Heidarinejad, Jelena Srebric

Pennsylvania State University, Mechanical and Nuclear Engineering, State College PA, United States

Keywords: CFD, UR-UVGI, UV intensity, Microorganism

### Surface Reactions on the Human Body: Using Personal Ventilation to Remove Squalene Oxidation Products from the Breathing Zone with CFD

Jackie S. Russo, H. Ezzat Khalifa

Syracuse University, Syracuse NY, United States

Keywords: Chemical Reactions, Ozone, Squalene, Personal Ventilation

### Personal VOC, No₂ And PM2.5 Exposures And Microenvironment Concentration Of Middle School Students In Seoul

Jong ryeul Sohn, Youn Hee Oh, Hyun Hee Park

Korea Univ., Seoul, Korea, Republic of

Keywords: Volatile Organic Compounds, Nitrogen Dioxide, particulate, Ozone, Personal

exposures

#### The Usefulness Of Personal Ventilation In Typical Office Setups

Jackie S. Russo, H. Ezzat Khalifa

Syracuse University, Syracuse NY, United States Keywords: Personal Ventilation, Inhalation Exposure

#### The Assessment Of Survey On The Indoor air Quality Of Children Care Centers In South Korea

Jong Ryeul Sohn, Jung Tae Kwon, YOON YONG JOU, Hyun Hee Park, Youn Hee Oh

Korea Univ., Seoul, Korea, Republic of

Keywords: formaldehyde, TVOC, IAQ, TBC, PM10

Article Number

#### The Actual Condition Of Air Environment In Large Scale Underground Cities

U. Yanagi, Naoki Kagi, Haruki Osawa, Koichi Ikeda, Naoya Nishimura, Hideki Saitou, Ryota Kamakura

Kogakuin University, Tokyo, Japan

Keywords: Indoor air environment, Air quality, Microbial contamination, Thermal environment,

Field survey

#### **Preparation of Sorbent Tubes' Certified Reference Materials**

Zeyi Zhou, Xin Zhou, Shuli Ma

National Institute of Metrology, gas laboratory, Beijing, China

Keywords: Sorbent tubes, Dynamic volumetric methods, Certified reference materials, Volatile

organic compounds

## Investigation of thermal comfort in Under-floor air distribution system with different throwing angle of swirling diffusers

Cheng Yuanda, Niu Jianlei, Li XiaoPing

The Hong Kong Polytechnic University, Hong Kong, China

Keywords: Throwing angle, thermal comfort, equivalent temperature,

#### **Feasibility Of Distributed Demand Control Ventilation In Cubicle Environments**

Vikas Dhummi, Harish J. Palanthandalam-Madapusi, H Ezzat Khalifa

Syraucse University, Syracuse NY, United States

Keywords: cubicle interaction experiments, cubicle coupling, TIEQ experiments,

#### **Development Of Subway Cabin Air Purifying System**

Soon-Bark Kwon, Duck-Shin Park, Youngmin Cho, Jong-Bum Kim, Taesung Kim

Korea Railroad Research Institute, Railroad Environment Research Department, Uiwang, Korea, Republic of

Keywords: roll-filter, gas absorber, subway cabin, electrostatic filter

#### Post-remediation Verification - One Practitioner's Approach

Michael McGuinness, CIH, CIAQP, ABIH-IEQ

R.K. Occupational & Environmental Analysis, Inc., Phillipsburg NJ, United States

Keywords: remediation, information, investigations, building ecology, standards, guidelines, codes

coues

### Studies On The Deterioration Of Chemical Substances Removal Performance Of Room Air

Cleaners (1st Report)

Atsuo Nozaki, Yasunori Narita, Yusuke Ichijo

Tohoku Bunka Gakuen University, Miyagi, Japan

Keywords: Room Air Cleaner, Deterioration, Formaldehyde, CADR

### The Effect Of Indoor And Outdoor Particle Sources On Indoor Air Quality Of A New Multilevel

Office Building In The Vicinity Of A Busway

Congrong He, Quang Tran, Lidia Morawska, Peter McGarry

Queesland University of Technology, Brisbane, Australia

Article Number

Keywords: ultrafine particle, particle number, indoor/outdoor relationship, ventilation system, filtration efficiency

#### Screening of Semi-volatile Organic Compounds (SVOCs) Emission From Household Products By

#### Micro- Chamber/ Thermal Extractor Method

Hideto Jinno, Toshiko Tanaka-Kagawa, Yoko Furukawa, Tetsuji Nishimura

National Institute of Health Sciences, Setagaya-ku, Japan

Keywords: Semi-volatile oganic compounds, Emission rate, Household products,

#### Determination of Partition and Diffusion Coefficient of Formaldehyde in Selected Building

#### **Materials and Impact of Relative Humidity**

Jing Xu, Jianshun S. Zhang, Xiaoyu Liu

Syracuse University, Syracuse NY, United States

Keywords: VOCs, Relative humidity, Source/emissions, Laboratory studies

#### **Effect Of Illuminance And Color Temperature On Productivity**

Tomohiro WARITA, Toshiharu IKAGA, Kazuyoshi HARIMOTO, Maki ICHIHARA

Keio University, Yokohama, Japan

Keywords: Performance, Lighting, Lighting satisfaction, Subjective experiment, Creative activities

### The Effect Of Relative Humidity Level, VOC Type And Multiple VOCs On The Performance Of Full-Scale GAC Filters

Ali KHAZRAEI VIZHEMEHR, Hamid Kholafaei, Fariborz Haghighat, Chang-Seo Lee

Concordia University, Montreal QC, Canada

Keywords: Indoor Air, relative humidity, VOC, mixture gas adsorption, GAC filter

### Resuspension of dust particles on textile floor coverings and VCT hard flooring in chamber and occupied school environments

Hai Vu, Richard Shaughnessy

University of Tulsa, Tulsa OK, United States

Keywords: flooring, particles, carpet, resuspension rate, schools

#### Verification Of Renewal Actions In Long-life Office Building By CASBEE

Yasunobu Watanuki, Takashi Akimoto

Shibaura Institute of Technology, tokyo, Japan

Keywords: long-life building, regular maintenance, renewal action, CASBEE

### Effects Of Radiant Cooling And Heating System On Thermal Comfort And Productivity In Elderly

**Care Facilities** 

Masato Kimura, Toshiharu Ikaga, Yoshihisa Hirayama

Keio University, Kanagawa, Japan

Keywords: Radiant cooling system, Thermal comfort, System coefficient of performance,

Productivity

#### Nature Of Printer-Generated Ultrafine Particles And Their Formation Processes

Article Number

Hao Wang, Congrong He, Lidia Morawska

Queesland University of Technology, Brisbane, Australia

Keywords: secondary organic aerosol, VH-TDMA, indoor air quality, printer emission

#### Investigation Of CO<sub>2</sub> Tracer Gas-Based Multi-Zone Model Calibration Airflow Models

Steven C. Snyder, Agami Reddy, William Bahnfleth

Penn State, University Park PA, United States

Keywords: Multi-Zone Model Calibration, Indoor Contaminant Dispersion, Building Leakage

Parameters, Sensitivity Analysis, Building Vulnerability

### Levels and Sources of Volatile Organic Compound (VOC) Concentrations in Detroit Homes of Asthmatic Children

Jo-Yu Chin, Stuart Batterman, Christopher Godwin, Edith Parker, Thomas Robins, Toby Lewis, Ashley O'Toole, The Community Action Against Asthma (CAAA) Steering Committee University of Michigan, Environmental Health Sciences, Ann Arbor MI, United States Keywords: VOC, Asthma, Indoor Air,

### An Epidemiological Investigation on Housing Characteristics And Asthma And Allergy Among Children In Seoul, Korea

Jieun Choi, Yoorim Choi, Chungyoon Chun, Yuexia Sun, Jan Sundell, Carl-Gustaf Bornehag LG Electronics, Seoul, Korea, Republic of

Keywords: Allergy, Asthma, Dampness, Housing Characteristics, Children

#### Long Term Measurement Of Natural Ventilation Rate In A Mock-up With Large Openings

Yong-Hyun Kim, Jeong-Sik Seo, J.S. Park

Hanyang University, Seoul, Korea, Republic of

Keywords: Natural ventilation, Mock-Up room, Wind velocity, Pressure difference, Large openigs

#### Measurements Of Secondary Organic Aerosols Formation From Ozone Initiated Chemistry With

#### Or Without Human Subjects In A Field Environmental Chamber

Moshood O. Fadeyi, Kwok W. Tham, Wei Yi Wu, Jovan Pantelic

The British University in Dubai, Sustainable Design of the Built Environment, Dubai, United Arab Emirates

Keywords: Contaminants, Control and intervention, Methods, Basic processes

#### **How To Identify Optimal Printer Location In Offices?**

Lina Wang, Lidia Morawska

Queesland University of Technology, Brisbane, Australia

Keywords: multiple zones, particle number concentration, particle retention rate, ventilation,

breathing zone

### A Case-control Study of the Effect of Indoor Environments on Health Problems among Japanese Children Part 1: Outline of Field Survey and Results of Indoor Humidity Evaluations

Kenichi Hasegawa, Hiroshi Yoshino, Keiko Abe, Koichi Ikeda, Noriko Kato, Kazukiyo Kumagai, Teruaki Mitamura, U. Yanagi, Naoya Ando, Kensuke Hamada Akita Prefectural University, Yurihonjo City, Akita Prefecture, Japan

Article Number

Keywords: Children's Health, Allergic Symptom, Exposure Measurement, Case-control Study, Indoor Humidity

#### Numerical Modeling Of Heatstroke In Aged Residents And Incidence Risk Assessment

#### **Considering Thermal Performance Of Housing Envelope And Living Behavior**

Yukiko Murakami, Toshiharu Ikaga, Shingo Hori, Masaru Suzuki

Graduated School Of Keio University, Yokohama, Japan

Keywords: Heatstroke, Aged residents, Numerical model, Body temperature, Thermal

performance of the housing envelope

#### Pollutant Removal Efficiency of Residential Kitchen Exhaust Hoods

Brett C. Singer, Alexander D. Sherman, Douglas P. Sullivan, Toshifumi Hotchi

Lawrence Berkeley National Lab, Berkeley CA, United States

Keywords: Carbon monoxide, Nitrogen dioxide, Range hood, Unvented combustion, Ventilation

### Case Study Of Indoor Climate Conditions In Multifamily Buildings In Lithuania : Before and After Renovation

Andrius Jurelionis, Lina Seduikyte

Kaunas University of Technology, Faculty of Civil Engineering and Architecture, Kaunas, Lithuania Keywords: residential buildings, renovation, indoor air quality, thermal comfort, SBS symptoms

#### **Volatile Organic Compounds In Building Structures And Indoor Air**

Annika Glader, Ingrid Liljelind

Novia University of Applied Sciences, Research and Development, Vasa, Finland

Keywords: Field studies, VOCs

#### Energy conservation and Indoor environmental quality for low-carbon office buildings

Aya Chiyonobu, Hiromasa Tanaka, Shin-ichi Tanabe

Department of Architecture, Waseda University, Tokyo, Japan

Keywords: BEMS, thermal environment, air-conditioning system, heat source system, CO2

emission

#### **Evaluation Of Infection Risk By Coughed Air In Hospital**

### Measurement Of Infection Risk Using The Human Cough Simulation Machine In A Medical

### **Examination Room**

Toshiki Isahaya, Takashi Ito, Hitomi Tsutsumi, Fumihiko Shinoda, Shin-ichi Tanabe, Satoshi Hori, Shoichi Morimoto, Takao Ariga

Waseda University, Tokyo, Japan

Keywords: Health care facilitie, Measurements, Infectious disease, Risk, Mechanical systems and

ventilation

#### **Comprehensive Particle Characterization During Four Nanotechnology Processes**

Peter McGarry, Luke Knibbs, Lidia Morawska

Queesland University of Technology, Brisbane, Australia

Keywords: workplace, exposure, nanomaterials,

Article Number

#### **Efficiency Of Household Plants In Removing Air Contaminants**

Benjamin Hanoune, Damien Cuny PC2A - CNRS, Villeneuve d'Ascq, France

Keywords: Air cleaning, VOCs, Laboratory studies,

### Development Of Dynamic Odor Bottle Method For Evaluating Odor From Wooden Building Material

Natsuki SATO, HOON KIM, Sin-ichi Tanabe

WASEDA University, Tokyo, Japan

Keywords: indoor air quality, perceived air quality, dynamic olfactmetry method, odor

# Infection risk of mold exposure - Results of a workshop of the annual conference of the German Society of Hygiene, Environmental Medicine and Preventive Medicine held in Stuttgart, Germany in 2009

Gerhard A. Wiesmüller, Regine Szewzyk, Thomas Gabrio, Steffen Engelhart, Werner J. Heinz, Oliver A. Cornely, Hans P. Seidl, Guido Fischer, Caroline E.W. Herr Gesundheitsamt der Stadt Köln, Infektions- und Umwelthygiene, Köln, Germany Keywords: mold, indoor air, health, infection risk, risk assessment

### Measurements of Viable Bioaerosol In Large Teaching Hospital Using An Ultraviolet Aerodynamic Particle Sizer (UVAPS)

Luke Knibbs, Piotr Grzybowski, Congrong He, Lidia Morawska, Scott Bell, Celine Lee, Graham Johnson

Queesland University of Technology, Brisbane, Australia

Keywords: bacteria, indoor air, health care, particle, measurement

#### Do Nightly Shut Down Ventilation Affect Indoor Air Quality In A Classroom During School Day?

Linda Hägerhed Engman, Andreas Fischer, Kristina Fyhr, Svein Ruud, Sarka Langer, Evert Ljungström

SP Technical Research Institute of Sweden, Building Physics and Indoor Environment, Borås, Sweden

Keywords: reduced ventilation, Schools, indoor air quality, field study

#### Measured Indoor Air CO<sub>2</sub> Concentration in Multi-Family Dwellings

Hans Bagge, Dennis Johansson, Lotti Lindstrii

Lund University, Lund, Sweden

Keywords: Carbon dioxide, measurements, residential, field studies

#### PM2.5 Emission Rates from Kerosene Lamps

Andrea Yarberry, Jason McCleland, Nathan Lohse, James Apple, Ryan Vicente, Dustin Poppendieck

Humboldt State University, Arcata CA, United States

Keywords: Particulate Matter, Lighting, Kerosene, LED

Article Number

#### The Effects Of Indoor Chemistry Products At Realistic Indoor Concentrations On Occupants'

Indoor Air Perception, Sick Building Syndroms Symptoms And Comforts.

Kwok W. Tham, Moshood O. Fadeyi, Jovan Pantelic, Wei Yi Wu

The British University in Dubai, Dubai, United Arab Emirates

Keywords: Health and Human Perception, Contaminants, Exposure, Control and Prevention

### Evaluation of Infection Risk by Coughed Air in Hospital Airborne Infection Control System of New Consultation Room

Shoichi Morimoto, Norikazu Kobayashi, Toshikatsu Ueda, Huaipeng Tang, Shin-ichi Tanabe, Hitomi Tsutsumi, Satoshi Hori

Shinryo corporation, Research & development center, Tsukuba, Japan

Keywords: Health care facilities, Infectious disease, Mechanical systems and ventilation,

Measurements, Risk

#### **Particle Emissions From Vacuum Cleaners**

Luke Knibbs, Congrong He, Caroline Duchaine, Lidia Morawska Queesland University of Technology, Brisbane, Australia Keywords: ultrafine particles, indoor sources, cleaning,

### Evaluation of Infection Risk by Coughed Air In Hospital Simulation of Coughed Air Distribution using CFD

Takashi Ito, Shin-ichi Tanabe, Toshiki Isahaya, Hitomi Tsutsumi, Fumihiko Shinoda, Satoshi Hori Waseda University, Science and Engineering, Tokyo, Japan Keywords: Infection control, Coughed air, Hospital, Simulation, CFD

#### Impact Of Cold Indoor Thermal Environments On Human Thermal Comfort

Hong Liu, Baizhan Li, Meilan Tan, Wenjie Li, Xiaolei Ma

Three Gorges Reservoir Key Laboratory of Ministry of Education, Chongqing University,

Chongqing, China

Keywords: cold environment, thermal sensation, indoor temperature setting,

#### **Vertical Profiles of Ultrafine Particles Around Urban Office Buildings**

Tran Ngoc Quang, Congrong He, Lidia Morawska, Luke Knibbs

Queesland University of Technology, Brisbane, Australia

Keywords: particle number concentration, Pm2.5 concentration, particle size range,

#### The Effect Of Human Movement On The Resuspension Of Airborne Particles

Mohammed S. Alshitawi, Hazim B. Awbi

University of Reading, Reading, United Kingdom

Keywords: Particulate matter, aerosols, carpets, clothing, walking speed and period

### The Effects of Ultrafine Particles from Traffic Emissions on Children's Health (UPTECH): Study Design

Lidia Morawska, Guy Marks, Zoran Ristovski, Kerrie Mengersen, Mandana Mazaheri, Matthew Falt, Wafaa Ezz, Paul Robinson, Godwin Ayoko

Queesland University of Technology, Brisbane, Australia

Article Number

Keywords: ultrafine particle metrics, vehicular emissions, particle spatial variation, children exposure

## Reaction intermediates and byproducts formed during trichloroethylene photocatalytic oxidation under typical indoor air levels

Olivier Debono, Frederic Thevenet, Valerie Hequet, Cecile Raillard, Laurence Lecoq, Nadine Locoge

Ecole des Mines, Douai, France

Keywords: indoor air treatment, photocatalysis, VOC, toxic by-products

## Relative Contribution Of Gas Cooking To Exposure Concentrations Of Nitrogen Dioixde: A Population Exposure Modeling Study

Arlene Rosenbaum, Stephen Graham ICF International, Rohnert Park CA, United States Keywords:

# Towards A Detailed Chemical Indoor Air Model For Residential Environs In The Southern Hemisphere Using A Dual Pathway Of Observational Data And The Master Chemical Mechanism (MCM) Framework

Shannan J. Maisey, Sandra M. Saunders, Peter J. Franklin, Nigel West University of Western Australia, School of Biomedical, Biomolecular and Chemical Sciences, Perth, Australia

Keywords: Reactive Chemistry, Secondary Pollutants, Models,

### Simulation Supported Field Study Towards Environmental Tobacco Smoke Leakage From Smoking Rooms In 19 Dutch Pubs

Piet Jacobs, Antoon Opperhuizen

TNO, Delft, Netherlands

Keywords: Hospitality industry, Environmental Tobacco Smoke, Nicotine, PM2,5, ventilation model

#### **Outdoor Sources Impact On Indoor Air Quality**

Eddie FAURE, Loïc PAILLAT, Ghislaine GOUPIL, Hélène ROPERT, Annie COURSIMAULT Laboratoire Central de la Préfecture de Police, Paris, France Keywords: Measurements, VOCs, Transfer mode, Dwellings, Health

### Creating Accurate Boundary Conditions for the Analysis of the Dynamic between Indoor and Outdoor Climate

Marie Haeger-Eugensson, Sarka Langer, Marcus Liljeberg, Aime Must, Kaisa Svennberg, Lin Tang, Erica Bloom

IVL Swedish Environmental Research Institute, Stockholm, Sweden

Keywords: indoor climate, outdoor climate, boundary conditions, mold damages, cultural heritage buildings

#### **Ductwork Contamination And Indoor Air Quality. A Literature Review**

Clara Peretti, Michele De Carli, Giacomo Villi, Francesco Viola

Article Number

DFT Department of Technical Physics, Padova, Italy

Keywords: Air ducts, HVAC systems, Mechanical ventilation, Contaminant, IAQ

#### Occupants' Evaluation Of Indoor Air Quality In Case Of Newly Built Apartment

Song-Jae Yang, Min-Jae Shin, J.S. Park

Hanyang University, Seoul, Korea, Republic of

Keywords: Occupants' Evaluation, Indoor Air Quality, Newly Built Apartment,

#### Characterization Of Fine Particles Emitted From An Indoor Household Clothes Dryer

Bangwoo Han, Hak-Joon Kim, Kyu-Dong Hwang, Yong-Jin Kim, Juhan Yoon, Byeong-Jo Ryoo, Dong-Yun Kim

Korea Institute of Machinery and Materials, Daejeon, Korea, Republic of

Keywords: Drying machine, Particulate, Emission, Health

#### A Study On Improvement Of Traditional Japanese Houses Considering Indoor Comfort And

#### **Energy Saving Using Three Test Houses**

Mao Tanaka, Motoya Hayashi, Hirano Youko

Miyagigakuin Women's University, Sendai, Japan

Keywords: Soil wall, Equivalent leakage area, Tracer gas, Ventilation rate, Infiltration ratios from

crawl space

#### **Carbon Monoxide Poisoning On Paris Territory**

Loïc PAILLAT, Eddie FAURE, Monique AYOUBI, Ghislaine GOUPIL, Claudie DELAUNAY Laboratoire Central de la Préfecture de Police, Paris, France

Keywords: surveys, oxidation products, sources/emissions, ventilation

#### Association between Renovation and Allergic Disorders in Children

Olf Herbarth, Matthias Richter

 $\label{thm:continuous} \textbf{University Leipzig, Faculty of Medicine, Environmental Medicine \& Hygiene, \ Leipzig, Germany}$ 

Keywords: indoor exposure VOC, allergic disorders, children, environmental health

#### Results Of Sensory Tests And Sensory-limit Settings For Building Materials In Germany

Birgit Müller, Jana Panaskova, Wolfgang Horn, Dirk Müller, Oliver Jann, Wolfgang Plehn

Hermann-Rietschel-Institut, Berlin, Germany

Keywords: odour labelling, perceived air-quality, odour labelling, standardisation, test procedure

#### The Effects Of Mechanical Ventilation Operation On Annual Energy Consumption

Min-Jae Shin, Hyung-Jun Kim, J.S. Park

Hanyang University, Seoul, Korea, Republic of

Keywords: Ventilation, Energy, Field studies, Residential

## Assessment Of Health And Performance Of Sixth Grade Students And Indoor Environmental Quality In Finnish Elementary Schools

Mari Turunen, Tuula Putus, Aino Nevalainen, Ulla Haverinen-Shaughnessy, Richard Shaughnessy National Institute for Health and Welfare, Department Of Environmental Health, Kuopio, Finland

Article Number

Keywords: schools, questionnaire, indoor environmental quality,

#### Applying C-history method to measure the VOC emission parameters of building materials and

furniture: tests and validation

Yao Yuan, Weiwei liu, Lixin Wang, Jinhan Mo, Yinping Zhang

Department of Building Science, Beijing, China

Keywords: VOCs, characteristic parameters, full scale chamber, furniture

#### Thermal Rehabilitation Of Buildings With High Thermal Inertia

LIGIA M. MOGA, IOAN MOGA

FACULTY OF CIVIL CONSTRUCTIONS, TECHNICAL UNIVERSITY OF CLUJ NAPOCA, CLUJ-NAPOCA,

Romania

Keywords: heat transfer, building energy performance, dynamic modelling, simulation,

Mathematical modelling

#### Closed-Chamber Test of Airborne Allergen Removal by an Electrical Air Cleaner

Hak-Joon Kim, Banwoo Han, Yon-Jin Kim, Sung-Hwa Lee, Jung-Won Park Korea Institute of Machinery and Materials, Daejeon, Korea, Republic of Keywords: Air cleaner, Allergen particulates, Chamber test, Removal

### Health Effects Of Indoor Pollutants: Integrating Microbial, Toxicological And Epidemiological Approaches (the HITEA study)

Aino I. Nevalainen, Gert Doekes, Dick Heederik, Joachim Heinrich, Maija-Riitta Hirvonen, Anne Hyvärinen, Deborah Jarvis, Rudolf Krska, Lennart Larsson, Juha Pekkanen, Helena Rintala, Jordi Sunyer, Martin Täubel, Jan-Paul Zock

National Institute for Health and Welfare, Department of Environmental Health, Kuopio, Finland Keywords: moisture/dampness, schools, residential, biological, respiratory health

#### Indoor Environmental Qualities And Productivity In An Energy-saving Building

Kotaro Ito, Shi-ichi Tanabe, Naoe Nishihara, Miwa Higuchi, Tsuyoshi Ito, Setsuko Yoshino, Ryohei Mase, Katsuaki Wada

Waseda University, Tokyo, Japan

Keywords: Productivity, Satisfaction vote, Worker's behavior, Office

#### Pressure Difference As A Mean Of Protection From Heavy Toxic Contaminants Migration.

Bogdan Mizielinski, Jacek Hendiger, Marta Chludzinska, Piotr Zietek

Warsaw University of Technology, Faculty of Environmental Engineering, Air Conditioning and Heating Department, Warsaw, Poland

Keywords: protection from contaminants, pressurization, contaminants migration,

#### **Simulation And Measurement Of Thermal Comfort And Sensation**

Conrad Voelker, Oliver Kornadt

Bauhaus-University Weimar, Weimar, Germany

Keywords: indoor climate, climatic chamber, thermal manikin, CFD, floor cooling

Article Number

#### A New Method To Evaluate The Performance Of Adsorbents For Indoor VOCs Purification

Qiujian Xu, Yinping Zhang, Jinhan Mo, Xinxiao Li

Department of Building Science, Tsinghua University, Beijing, China

Keywords: adsorption performance evaluation, air cleaning, volatile organic compound, Indoor

air quality

### Determination Of The Thresholds Of Typical Indoor Pollutants From Furniture Emission In Full-scale Chamber

Weiwei Liu, Yuan Yao, Yinping Zhang

Department of Building Science, Tsinghua University, Beijing, China

Keywords: Residential, Surveys, VOCs, Sources/emissions

### Validation And Performance Test Of The Reduction Formaldehyde Concentrations For Indoor Environment By Sorptive Building Materials In Taiwan

Kun Chih Huang, Che Ming Chiang, Ching Chang Lee, Fang Ming Lin, Wen Cheng Shao Department of Architecture, College of Engineering, National Cheng Kung University, Taiwan, ROC, Tainan, Taiwan

Keywords: Adsorption Performance, Desorption, Green Building Material, Formaldehyde, Test system

#### Comparing The Performance Of A New Electrical Aerosol Detector With Other Counters

Siamak Rahimi Ardkapan, Alireza Afshari, Niels Christian Bergsøe

Department of Energy and Environment, Danish Building Research Institute, Aalborg University, Hørsholm, Denmark

Keywords: Particle counter, Electric charging, Electrical aerosol detector,

#### Intermittent Operation of Mechanical Ventilation in Apartments for IAQ and Energy Saving

Jae-Yong Yoon, Cheol-Woong Shin, J. S. Park

Hanyang Univ, Seoul, Korea, Republic of

Keywords: Apartment, Ventilation system, Intermittent Operation, Indoor Air Quality

#### Simulation Of Solid Fuel Burning Events In Irish Fireplaces Under Varying Air Exchange Rates

James McGrath, Miriam Byrne, Terry Andrew, Mike Ashmore, Sani Dimitroulopoulou National University of Ireland Galway (NUIG), School of Physics, Galway, Ireland Keywords: Modelling, Ventilation, PM2.5, Residential Emissions, Solid Fuels

### Oxidative Decomposition Of Formaldehyde At Room Temperature By Manganese Dioxide Blended With Ceria

Yosuke Takao, Yoshika Sekine, Emu Kimura Tokai University, Hiratsuka-city, Kanagawa-ken, Japan Keywords: Air Cleaning, Chemistry, VOCs,

### Impact of renovation with well-insulated windows on indoor thermal environment and thermal comfort

Ikue MORI, Kazuyo TSUZUKI, Futoshi MATSUMOTO

Article Number

National Institute of Advanced Industrial Science and Technology (AIST), Human Technology Research Institute, Tsukuba, Japan

Keywords: Residential, Comfort, Field studies,

#### Measuring Aerosol Particle Behaviour Due To Human Activity Indoors For Re-exposure Evaluation

Ann McDonagh, Richard Sextro, Miriam Byrne
Naional University of Ireland Galway (NUIG), Physics, Galway, Ireland
Keywords: Measurements (detection, identification, quantific, Exposure, Particles (contaminants), Resuspension

#### Indoor Air Humidity, The Sensations Of Humidity And Dryness, And SBS Symptoms

Juan Wang, Baizhan Li, Jan Sundel, Jing Liu, Xinyun Cao, Tianli Zhong Chongqing University, Chongqing, China

Keywords: Dry Air, Humid Air, Sick Building Syndrome, Thermal Sensation

#### Evaluation Of Air Conditioning Systems And Cooling Items By Productivity And Eco-efficiency

Yuri Akiyama, Shin-ichi Tanabe, Naoe Nishihara, Atsushi Kasuya, Kazuki Wada, Gen Kawaguchi, Kanae Sako

Waseda Univerisity, Tokyo, Japan

Keywords: Thermal Environment, Productivity, Eco-efficiency, Radiant cooling system, Cooling items

#### **China Indoor Radon Levels And Control Of New Measures**

Zhenhua ZHANG, LI ZHU, Hengguan Yi, Hui Zhang, Zhigang Pei, Xiaoxiong Zhuo Dept.of Engineering Physics, Tsinghua Univ., Beijing, China Keywords: Radon, Radon specific activity, controlling index, Radon exhalation, Novel measure

### Can A Ventilation System Create A Healthier Classroom Indoor Environment In Belgian Schools?

Marianne Stranger, Eddy Goelen VITO, Mol, Belgium

Keywords: green and sustainable buildings, schools, mechanical systems and ventilation, VOCs, particles

#### Study On Characteristics And Evolution Of Particles Generated By Cooking

Poon Ka Man, Alvin Lai

City University of Hong Kong, Building and Construction, Hong Kong, Hong Kong Keywords: Ultrafine particles, Coagulation, Size distribution, Indoor source

#### Developing clinical evaluation method for the air purifier system

Yoon-Shin Kim, Cheol-Min Lee, Keun-Young Kim, Sunju Namgoung, Young-Suck No, Gwi-Nam Bae Hanyang University, Seoul, Korea, Republic of

Keywords: air purifier, clinical evaluation method, biological pollutant, indoor environment

Article Number

#### **Material Emissions Impact To Indoor Air Quality**

Ingrid Šenitková, Tomáš Tomcík

Technical university of Košice, Civil Engineering Faculty, Košice, Slovakia

Keywords: TVOCs concentration, Material surfaces, Health, Indoor air quality, Chemical

assessments

#### **Optimization Of Ventilation System Design And Operation In Hospital Wards**

Amirul I. Khan, Catherine J. Noakes, Vassili Toropov

University of Leeds, School of Civil Engineering, Leeds, United Kingdom

Keywords: Optimization, Computational Fluid Dynamics, Pathogen transport,

#### Observation of Environmental Control Behavior and Resultant Indoor Environment in

#### **Elementary School Classrooms in which Cooling Equipments are Used**

Takashi Kurabuchi, Yukari Iino, Kumiko Tsuruta

Tokyo University of Science, Tokyo, Japan

Keywords: Elementary school classroom, Environmental control behavior, Subjective thermal

evaluation, Thermal adaptation, Cooling equipment

### Physiological effects on humans when exposed to nanometer sized airborne particles in well controlled chamber studies

Mats Bohgard, Jörn Nielsen, Inger Hagerman, Bo A.G. Jönsson, Ulla B.K. Andersson, Eva Assarsson, Anders

Gudmundsson, Katrin Dierschke, Christina Isaxon, Joakim Pagels, Aneta Wierzbicka

Lund University, Ergonomics and Aerosol Technology, Lund, Sweden

Keywords: nano particles, physiological effects, aerosols, heart rate variability

#### Effect Of Two Aerosolization Methods On The Release Of Fungal Propagules From

#### **Contaminated Surface**

Rafal L. Górny, Anna Lawniczek-Walczyk

Central Institute for Labour Protection - National Research Institute, Department of Chemical

and Aerosol Hazards, Warsaw, Poland

Keywords: fungi, fragments and spores, swirling release, air velocity, agar surface

#### Home environment and its association with asthma and allergies among 2- 6 Year-Old children

in Chongging, China: a cross-sectional study

Qin Yang, Baizhan Li, Jan Sundell, Juan Wang, Han Wang, Yongqiang Li

Chongqing univercity, Chongqing, China

Keywords: Home, Asthma, Allergy, Children, China

### Role Of Occupational Physician In The Assessment And Management Of Indoor Air Quality

#### **Problems**

Paolo Carrer, Giacomo Muzi, Peder Wolkoff

University of Milan, Dpt of Occupational Health, Ospedale Sacco, MILAN, Italy

Keywords: office workers, health surveillance

#### **New Indicators For Energy Efficiency Of Buildings**

Article Number

Pekka Tuominen, Krzysztof Klobut, Jari Shemeikka

VTT Technical Research Centre of Finland, Espoo, Finland

Keywords: Indicators, building energy efficiency, energy intensity, energy measuring, energy

economics

## Asthma, Respiratory Symptoms, Airway Infections, And A History Of Allergy In Relation To The Home Environment Of Pupils In Johor Bahru, Malaysia

Gunilla I. Wieslander, Jamal H. Hashim, Zailina Hashim, Guihong Cai, Faridah Ali, Dan E. Norback Occupational and Environmental Medicine, Medical Sciences, Uppsala, Sweden

Keywords: asthma, airways, home risk factors, tropical climate

### Detection of Biohazardous Effect of House Dust based on the Bioluminescence of Marine

Bacterium Vibrio fischeri

Shiro Ikeda, Yoshika Sekine, Masafumi Oikawa

Tokai University, Hiratsuka, Japan

Keywords: Bioassay, Inhibition, Indoor particles, Chemical component, Bioluminescent bacterium

### Cumulative Indoor Exposures To Semi-volatile Organic Compounds In France: Measurement Methods In Settled Dust

Fabien Mercier, Philippe Glorennec, Mickaël Derbez, Olivier Thomas, Barbara Le Bot

EHESP - School of Public Health, Rennes, France

Keywords: Indoor environments, SVOCs, Sampling, Analytical method, Gas chromatography

### Removal Of Ultrafine Particles And Particles Of The Most Penetrating Size By New Intermediate Class Filters

Bingbing Shi, Lars E. Ekberg, Sarka Langer

Building Services Engineering, Chlamers University of Technology, Energy and Environment, Göteborg, Sweden

Keywords: Intermediate class filters, UFP, MPPS, Test Aerosol, Filter Standard

## Influence of the background total volume mixing air delivery system on the exposure induced by cough for a hybrid personalized ventilation system

Kwok Wai Tham, Jovan Pantelic

National University of Singapore, Building, National University of Singapore, Singapore

Keywords: cough, airborne infection disease spread, personalized ventilation, breathing thermal

manikin

#### Secondary Indoor Air Pollution from a Commercial Air Freshener under UV Irradiation

Gwi-Nam Bae, Seung-Bok Lee, Thai Phuong Vu, Sun-Hwa Kim

Korea Institute of Science and Technology, Seoul, Korea, Republic of

Keywords: Air freshener, Indoor pollution, UV, VOCs, Nanoparticle

### Measurement Of Four Kinds Of Vocs Emission From An Adhesive Considered Diffusion Through The Building Materials

Atsushi Koganezawa, Hisato Nakamura, Hoon Kim, Takehiko Mitsuda, Seijiro Hayashi, Shin-ichi Tanabe

Article Number

Waseda University, Tokyo, Japan

Keywords: VOC, Adhesive, Emission rate, Small chamber, Calcium silicate

#### **Determination Of Volatile Organic Compound Profiles In Health Care Settings**

Ryan F. LeBouf, Aleksandr B. Stefaniak, M. Abbas Virji

NIOSH, Morgantown WV, United States

Keywords: VOC, sampling and analysis, gas chromatography, mass spectrometry, accuracy

### The Use Of Screening Tests To Determine Emissions Of VOCs From Building And Furnishing Materials

Veronica M. Brown, Derrick R. Crump

Cranfield University, Health, Cranfield, United Kingdom

Keywords: Micro-scale chamber, Nalophan bag, Sorbent tubes, TD/GC/MS, TargetView software

#### Indoor Environment Exposure And Absenteeism In 151 Danish Day-Care Facilities

Geo Clausen, Sine Gustavsen, Jørn Toftum, Susanne Buhl, Mette Bill Ladegaard, Michael Callesen Technical University of Denmark, Kongens Lyngby, Denmark

Keywords: Field studies, Infectious disease, Ventilation, Linear regression

#### Determining The Impact Of A High Efficiency Wood Boiler On Local Air Quality

William A. Turner, Frederick McKnight, Steven Caulfield Turner Building Science & Design, LLC, Lyndonville VT, United States Keywords: woodsmoke measurement, Phase I & Phase II Outdoor Wood Boilers, outdoor wood furnace, PM 2.5 & Wood Smoke, Phase II Changeout Program

### Web Site With The Dual Purpose Of Giving Dwelling Specific Advice To Occupants And Performing A Statistical Survey Concerning Quality Of The Indoor Climate In Homes

Lars Gunnarsen, Marie Frederiksen, Carina Refsing Nissen

Danish Building Research Institute (SBi), Construction and Health, Hoersholm, Denmark

Keywords: Web based, survey, indoor climate, quality, occupant feed back

## Onset Of Non-specific Building Related Symptoms In The Dwelling And Biomarkers A Cohort Study From 1992 To 2002.

Bo Sahlberg, Norbäck Dan, Wieslander Gunilla, Janson Crister

Occupational and Environmental Medicine, Uppsala, Sweden

Keywords: Asthma, Allergy, non-specific building related symptoms, Indoor environment,

**Biomarkers** 

#### **Design And Benefits Of Re-circulating Particle Filtration Unit**

Michal Spilak, Lars Gunnarsen, Marie Frederiksen Danish Building Research Institute (SBi), Horsholm, Denmark Keywords: Ultrfine particles, Filtration, PM2.5, Occupant's health

## CFD Validation Of Controlled Bioaerosol Release For Simulating Droplet Transmission Of Live Pathogens

Article Number

Marco-Felipe King, Miller A. Camargo-Valero, Catherine J. Noakes, Patrick A. Sleigh University of Leeds, Leeds, United Kingdom

Keywords: pathogen deposition, hospital ward, CFD simulation, bioaerosol transport

#### Ventilation Performance Of Present Airborne Infection Isolation Rooms In Finland

Marko Hyttinen, Kari Salmi, Erkki Kähkönen, Rauno Holopainen, Seppo Enbom, Pertti Pasanen, Pentti Kalliokoski, Anna Kokkonen, Kari Reijula

University of Eastern Finland, Kuopio, Finland

Keywords: Health care facilities, ventilation, isolation room,

### A Full Chain Mechanistic Approach Assessing Health Risks From Multiple Sources In Indoor Environments

Dimosthenis A. Sarigiannis, Alberto Gotti, Spyridon Karakitsios, Asikainen Arja, Matti Jantunen, Sean Semple, Rudi Torfs, Karen Galea, Martie van Tongeren

Aristotle University of Thessaloniki - Department of Chemical Engineering, Thessaloniki, Greece Keywords: cumulative exposure, aggregate exposure, internal dosimetry modeling, integrated exposure assessment

#### Clothing adjustment as a reply for temperature changes indoors

Dorota Maria Belkowska

Warsaw University of Technology, Warsaw, Poland

Keywords: thermal sensation, response to temperature variations, clo value,

#### **Characterization Of VOCs And Aldehydes Emissions From Household Products**

Melanie NICOLAS, Jerome NICOLLE, Laura CHIAPPINI, Barbara D'ANNA, Marianne FERNANDEZ, Francois MAUPETIT

IRCELYON - CNRS - University of Lyon / CSTB, Saint-Martin-d'Heres, France

Keywords: Emissions, Household products, VOCs, Formaldehyde

#### Particles In Indoor Air - Measurements In Residential Dwellings

Christina Isaxon, Andreas Dahl, Erik Nordin, Gunilla Wieslander, Mats Bohgard, Dan Norbäck, Anders Gudmundsson, Aneta Wierzbicka

University of Lund, Ergonomics and Aerosol Technology, Lund, Sweden

Keywords: aerosol exposure, health effects, real-time measurements,

#### **Investigations On Radon Exhalation Of Different Building Materials**

Matthias Richter, Oliver Jann, Joachim Kemski, Ralf Klingel, Uwe Schneider, Christian Krocker BAM Federal Institute for Materials Research and Testing, Berlin, Germany Keywords: radon exhalation, building material, emission test chamber, indoor air

#### Levels and Sources of Carbonyl Compounds in Private Vehicles in Lublin, Poland

Marzena R. Dudzinska, Amelia Staszowska Lublin University of Technology, Lublin, Poland

Keywords: indoor air quality, eye irritants, automobiles,

Article Number

#### Field Studies On The Impact Of Domestic Activities On Indoor Air Quality

Jerome NICOLLE, Laura CHIAPPINI, Sebastien FABLE, Barbara D'ANNA, Christian GEORGE, Francois MAUPETIT, Melanie NICOLAS

IRCELYON - CNRS - University of Lyon / CSTB, Saint-Martin-d'Heres, France

Keywords: Emissions, VOCs, Reactivity, Formaldehyde, SOA

#### **Evaluate The Local Air Change Effect In Arbitrary Area With Local Air Change Rate**

Xiaoliang Shao, Xianting Li, Hao Cai, Xuan Jiang, Xiaojun Ma Department of Building Science, School of Architecture, Tsinghua University, Beijing, China Keywords: Ventilation, Air change rate, Non-uniform indoor air, Numerical simulation

# Estimation of personal NO<sub>2</sub> exposure for subjects with asthma included in a double-blind crossover study on inflammatory response in the airways after repeated exposure to 200 and 600 ppb of NO<sub>2</sub>

Gaëlle Guillossou, Véronique Ezratty, Serge Koscielny, Catherine Neukirch, Monique DEHOUX, Marcel BONAY, Patrick MURE, Luc ROPERT, Sandra TOKAREK, Jacques LAMBROZO, Michel AUBIER

EDF Medical studies Department, Levallois Perret, France

Keywords: Nitrogen dioxide, personal exposure, passive sampler, radiello

#### Properties Of Ultra-Fine Particles Emitted From Heated Surfaces Of Household Appliances

Tobias Schripp, Ina Kirsch, Tunga Salthammer

Fraunhofer Wilhelm-Klauditz-Institut, Material Analysis and Indoor Chemistry, Braunschweig, Germany

Keywords: emission test chamber, toaster, baking oven, FMPS, UFP

#### Effects Of Introducing Task/ambient System With Ceiling Radiation Membrane On Productivity

Kanae Sako, Shin-ichi Tanabe, Naoe Nishihara, Kazuki Wada, Atsushi Kasuya, Gen Kawaguchi, Yuri Akiyama

Waseda University, Tokyo, Japan

Keywords: Thermal Environment Productivity, Radiant cooling system, Subjective experiment,

#### Corrosivity Of The Air And The Influence Of Building And Furnishing Materials In Museums

Finn Englund, Monika Fjaestad, Martin Ferm

SP Technical Research Institute of Sweden, Stockholm, Sweden

Keywords: Occupational, Sources/emissions, Field studies, VOCs, Moisture

#### Impact Of Air Fresheners On Indoor Air Quality

Erik Uhde, Nicole Schulz, Doreen Markewitz, Wolfgang Delius Fraunhofer WKI, Braunschweig, Germany

Keywords: VOCs, Secondary organic aerosols, fragrances, diffusers

### LTP-MS Of PM2.5 Filters Sampled In Dwellings - A New And Simple Fingerprinting Method

Anni Vibenholt, Asger W. Nørgaard, Peder Wolkoff

NRCWE, Copenhagen Ø, Denmark

Keywords: Inhalable particles, phthalates, fatty acids, screening

Article Number

# Analysis of Settled Dust – Another Investigative Tool for IEQ Practitioners

Michael McGuinness, CIH, CIAQP, ABIH-IEQ

R.K. Occupational & Environmental Analysis, Inc., Phillipsburg NJ, United States Keywords: investigations, particles, air cleaning, healthy homes, building ecology

#### **Determination Of PM10 And VOC Emissions From Candles In Test Chamber**

Gabriela Ventura Silva, Anabela Martins, Susana Martins, Armando Santos, Eduardo de Oliveira Fernandes, Paulo Costa

IDMEC-FEUP, Porto, Portugal

Keywords: Methods, Measurements

### Factors affecting Energy Consumption in an Apartment Building: Field Survey and

#### **Computerized Simulation**

Kentaro Mori, Takashi Akimoto, Tatsuo Nagai, Keisuke Emoto

Shibaura Institute of Technology, Tokyo, Japan

Keywords: apartment house, floor heating, heating consumption, location of unit, simulation

# The Daily And Seasonal Variability In Residential Concentrations Of Aldehydes In Two Canadian Cities

Marie-Eve Héroux, Nina A. Dobbin, Mark D. Gibson, Judy R. Guernsey, Warren Kindzierski, Keith Van Ryswyk, Amanda J. Wheeler

Health Canada, Ottawa ON, Canada

Keywords: indoor air exposure, sources, field studies, formaldehyde, ventilation

#### The Importance Of Wording In Indoor Climate Questionnaires

Kjell Andersson, Göran Stridh, Inger Fagerlund

Environmental medicine KA, Örebro, Sweden

Keywords: Indoor climate questionnaires, wording, symptoms, external validity

#### Chemical Emissions from TV Sets And the Labeling Criteria for Indoor chemicals

Dong-won Yoon, Hyo-Seok Kang, Ji-Hyun Kim

Kyungwon University, Sungnam, Korea, Republic of

Keywords: VOCs and Formaldehyde, Full size test chamber, TV set PDP and LCD TV, Chemical

emission from the products

#### Occupant behavior is related to building energy consumption and IAQ-a Chinese perspective

Zhe Li, Yingxin Zhu, Borong Lin

Dept. of Building Science and Technology, Beijing, China

Keywords: Sustainability

# Environmental Tobacco Smoke exposure in indoor spaces. Using realtime instruments to educate smokers, nonsmokers, policy makers and the media

Sean Semple, Karen S. Galea, Andrew Apsley

Article Number

University of Aberdeen, Aberdeen, United Kingdom Keywords: Exposure, Inhalation, Contaminants, Particles

# Improving Indoor Air Quality And Asthmatic Children's Health Using A Window-mounted Ventilation/filtration Unit

Suresh Raja, Andrea R. Ferro, James Laing, Philip K. Hopke, Larry E. Wetzel, Cheryl Gressani Clarkson University, Center for Air Resources Engineering and Science, Potdsam NY, United States

Keywords: indoor air cleaning, placebo, asthma, ventilation

#### Multi-zone Ventilation Measurements With Metabolic CO2 As The Tracer Gas

Lili Wei, Jan Sundell, Yuexia Sun, Yufeng Zhang

Architecture Engineering Department, Pennsylvania State University, School of Environmental Science and Technology, State College,PA PA, United States

Keywords: Ventilation, air change rate, metabolic CO2, multi-zone model

#### **Modeling Dynamic Aerosol Processes For Indoor Ultrafine Particles**

Donghyun Rim, Jung-il Choi, Andrew Persily, Lance Wallace National Institute of Standards and Technology, Gaithersburg MD, United States Keywords: Indoor aerosol, Ultrafine particles, Coagulation, Deposition, Aerosol process

# Can increase of the supply flow rates cause reduction of the exposure to cough released droplets when total volume systems are used?

Jovan Pantelic, Kwok Wai Tham

National University of Singapore, Building, Singapore, Singapore

Keywords: cough, airborne infection disease transmission, ventilation, thermal manikin

#### Near field Pollutant Dispersion Around Buildings In The Urban Environment

Ali Bahloul, Mauricio Chavez, Bodhisatta Hajra, Ted Stathopoulos IRSST, montreal QC, Canada

Keywords: CFD, Wind tunnel, Stack, Dilution, ASHRAE

# Numerical And Experimental Investigation Of Dust Particle Resuspension In Indoor Environment Under Turbulent Airflow

Iman Goldasteh, Goodarz Ahmadi, Andrea Ferro Clarkson University, Potsdam NY, United States

Keywords: Particle Resuspension, Dust Particle, Wind Tunnel, Numerical Model, Turbulent flow

#### Improved Photo-catalyst Filter For The Air Pollution Removal Of Indoor Air Cleaners

Yu Lin Chen, Chao-Heng Tseng, Ming-Jui Hung, Huang-Chin Wang, Sy Yuan Kang Enviromental Engineering and Managment, Taipei, Taiwan Keywords: foamy nickel filter, photo-catalysis, removal efficiency,

Partitioning Theory Applied To Paired Indoor Air And House Dust Semivolatile Organic Compound Measurements: Predicting House Dust Concentrations From Indoor Air

Article Number

Robin E. Dodson, Ruthann A. Rudel, Laura J. Perovich, David E. Camann, Julia G. Brody Silent Spring Institute, Newton MA, United States

Keywords: semivolatile organic compounds, octanol-air partitioning, gas-phase air,

# Health And Wellbeing In Relation To The Quality Of Ventilation Systems In Newly Built Dwellings In The Netherlands

Rik Bogers, Jongeneel Rob, Van Kamp Irene, Koudijs Ellen

National Institute for Public Health and the Environment (RIVM), Centre for Environmental Health, Bilthoven, Netherlands

Keywords: mechanical ventilation, balanced ventilation, indoor environment, subjective health, nonspecific health symptoms

# Effects Of Repeated Exposure To 200 And 600 ppb Of No₂ On Inflammatory Response In Subjects With Asthma.

Véronique EZRATTY, Gaëlle GUILLOSSOU, Serge Koscielny, Catherine Neukirch, Monique DEHOUX, Marcel BONAY, Patrick MURE, Luc ROPERT, Sandra TOKAREK, Jacques LAMBROZO, Michel AUBIER

EDF Medical studies Department, Levallois Perret, France

Keywords: nitrogen dioxide, asthma, human exposure study,

# Thermal And Non-thermal Germicidal Effect Of Microwave Radiation For Microbial Contamination

Yoonkyung KANG, Minki SUNG, Jonghun KIM, U. YANAGI, Keiko ABE, Mitsuo HARADA, Shinsuke KATO

The University of Tokyo, Department of Architecture, Tokyo, Japan

Keywords: Microwave radiation, germicidal effect, humidifier,

#### Reduction Of Exposure To Ultrafine Particles By Kitchen Exhaust Fans Of Varying Flow Rates

Donghyun Rim, Lance Wallace, Andrew Persily

National Institute of Standards and Technology, Gaithersburg MD, United States

Keywords: Ultrafine particles, Gas burner, Kitchen exhaust hood, Occupant exposure, Particle removal

#### Sustainability And Green Building Products: A Global Approach

Mikaela Decio, Tiziano Cerulli, Roberto Leoni

Mapei Spa, Milan, Italy

Keywords: voc, low emissions, label, micro chambers

### Continued Low Symptom Prevalence One and Three Years after a Costly Restoration of an Apartment Building with Severe Indoor Climate Problems

Göran Stridh, Kjell Andersson, Inger Fagerlund

LGS Environmental, Malmö, Sweden

Keywords: SBS symptoms, MM Questionnaire, Indoor climate problems, Restoration, Apartment

buildings

#### Tracking Performance Of A Microbial Consortium Aerosol In The Filter Stage Of A HVAC

Article Number

Audrey FORTHOMME, Laurence Le Coq, Yves Andrès, Aurélie Joubert, Denis Bemer, Philippe Duquenne, Xavier Simon

Ecole des Mines de Nantes, DSEE, Nantes, France

Keywords: Bioaerosol, Filtration, HVAC, Microbial consortium, Indoor air

# A Systematic And Controlled Study For Comparison Of Ultrafine And PM2.5 Particles Emitted During Frying

Iman Goldasteh, Mehdi Amouei Torkmahalleh, Yijia Zhao, Alan Rossner, Philip Hopke, Andrea Ferro

Clarkson University, Potsdam NY, United States

Keywords: Frying, cooking oils, PM2.5, size distribution, particulate matter

# The Effectiveness Of In Room UVGI Disinfection Devices At Providing Local Control Of Airborne Infection Transmission

Marco-Felipe King, Laura Pickin, Catherine J. Noakes, Louise A. Fletcher, Carl Gilkeson, P. Andrew Sleigh

School of Civil Engineering, University of Leeds, Pathogen Control Engineering Institute, Leeds, United Kingdom

Keywords: UVGI, CFD, infection control, bioaerosol sampling

#### Indoor Air Pollution And Lung Function Growth Among Children In Four Cities in China

Ananya Roy, Wei Hu, Cynthia Liu, Fusheng Wei, Robert S. Chapman, Junfeng Zhang EOHSI, UMDNJ, Piscataway NJ, United States

Keywords: Epidemiology, Other respiratory, Survey, residential, Developing country

#### **Influence Of The Substrate On Water-based Paints Emissions**

Fabio Abbà, Mikaela Decio, Tiziano Cerulli, Roberto Leoni

Vinavil Spa, villadossola, Italy

Keywords: water based paints, in-can voc, emission chambers, micro chambers

# Making Health Standard: Environmental Protection Agency's Health & Indoor Air Quality Protocols for Residential Energy Retrofits and Upgrades

Terry Brennan, Eric Werling

U.S. Environmental Protection Agency, Indoor Environments Division, Washington, DC DC, United States

Keywords: weatherization, residential energy retrofit, indoor air quality, health and safety, EPA guidance

# Measurement Of Emerging SVOCs In Indoor Air Using Novel Active And Passive Sampling Methods

Robin E. Dodson, Laura J. Perovich, Marcia G. Nishioka, John D. Spengler, Jose Vallarino, Ruthann A. Rudel

Silent Spring Institute, Newton MA, United States

Keywords: semivolatile organic compounds, URG sampler, polyurethane foam,

#### **Complexities Of CFD Modeling For Large Naturally Ventilated Hospital Wards**

Article Number

Carl A. Gilkeson, Catherine J. Noakes, Andrew P. Sleigh

University of Leeds, Leeds, United Kingdom

Keywords: Computational Fluid Dynamics, Numerical, Sensitivity, Infection Control, Pathogen

**Transport** 

#### **VOC Content And VOC Emissions Of Different Flooring Indoor Use Paints**

Gabriela V. Silva, Anabela Martins, Susana Martins, Eduardo de Oliveira Fernandes

IDMEC-FEUP, Porto, Portugal

Keywords: Methods, Laboratory studies

# Indoor Air Quality in 53 Classrooms in Paris: Chemical Pollutants, Allergens and Ambiance Parameters

Hanitriniala RAVELOMANANTSOA, Stéphanie DIALLO, Murielle Dusseaux, Laurence Bordenave, Sophie Barral

Laboratoire d'Hygiène de la Ville de Paris, Paris, France

Keywords: air pollution, children, school, indoor sources, environment monitoring

#### From Knowledge To Action: Giving Birth To A New Framework On IAQ Related Policies In EU

Eduardo de Oliveira Fernandes, Stylianos Kephalopoulos, Matti Jantunen, Paolo Carrer, Dimitrios Kotzias, Giulio Gallo, Manfred Fuchs

IDMEC-FEUP, Porto, Portugal

Keywords: indoor air quality, source control, exposure control, policies, green paper

#### Removal Of Perfluorocarboxylic Acids From Carpets Treated With Stain-resistant Products

Heidi Hubbard, Guo Zhishi, Krebs Ken, Roache Nancy, Corey Mocka, Robert Pope ICF International, Durham NC, United States

Keywords: perfluorooctanoic acid, microenvironments, risk management,

### Evaluation of A Liquid Cyclone high-volume Air Sampler Coupled With Solid-phase Cytometry

### For The Detection And Quantification Of Viable Fungi In Indoor Environments

Delphine Méheust, Jean-Pierre Gangneux, Pierre Le Cann

EHESP, Rennes, France

Keywords: Measurements (detection, quantification), Biological, Health care facilities, Infectious

disease, Fungal contamination

# Factors Impacting Passenger And Crew Comfort And Health-related Symptoms Aboard Commercial Aircraft

Ann Louise Sumner, Bradley P. Goodwin, Robert A. Lordo, John D. Spengler, Jose Vallarino, Eileen McNeely, Chester Spicer, Hanine Estephan

Battelle, Columbus OH, United States

Keywords: aircraft, indoor air quality, comfort, perception

### U.S. Environmental Protection Agency "Moisture Control in Public and Commercial Buildings:

#### Guidance for Design, Construction and Maintenance Professionals"

Terry Brennan, Eric Werling, Lew Harriman, Michael Clarkin

Camroden Associates, Inc., Westmoreland NY, United States

Article Number

Keywords: Moisture Control, EPA guidance, design guidance, condensation, mold

#### An Investigation Into Re-entry of Exhaust Air in Mechanically Ventilated Dwellings

Jaap R. Balvers, Froukje van Dijken, Atze C. Boerstra

BBA Indoor Environmental Consultancy, Rotterdam, Netherlands

Keywords: mechanical ventilation, houses and homes, re-entry, recirculation, measurement

technique

#### Microbiological Contamination Assessment Of Ventilation Systems

Katarína Knížová, Zuzana Vranayová, Danica Košicanová

Technical University of Kosice, Civil Engineering Faculty, Kosice, Slovakia

Keywords: air treatment, biological indicator, hygienic operation, particle deposition, risk analysis

## Impact of Perceived Personal Control over Indoor Climate on Health and Comfort in Dutch Offices

Atze C. Boerstra, Tim C. Beuker

BBA Indoor Environmental Consultancy, Rotterdam, Netherlands

Keywords: individual control, local climatisation, personal symptom index, building related

symptoms

#### Research Needed To Address Climate Change Impacts On Indoor Air Quality

John Girman

Cadmus Group, Arlington VA, United States

Keywords: heat waves, ozone, wildfires, allergens, energy efficiency

### The Potential Of Geothermal Energy Usage In Latvia

Yelena Pshenichnaya, Andris Kreslinsh

Riga Technical University, Riga, Latvia

Keywords: Geothermal energy perspective, Environmentally friendly energy policy in Latvia

# The Influence of the Building Process on Shortcomings in Dutch Mechanical Home Ventilation Systems

Jaap R. Balvers, Froukje van Dijken, Atze Boerstra

BBA Indoor Environmental Consultancy, Rotterdam, Netherlands

Keywords: mechanical ventilation, dwellings, houses, performance reqquirements, questionnaire

### New SPME-based Passive Sampler For On-site Simultaneous Sampling Of Formaldehyde And

### **VOCs Emitted By Materials In Indoor Environments**

Delphine BOURDIN, Valérie DESAUZIERS, Pierre MOCHO

Ecole des Mines d'Alès, Pau, France

Keywords: VOCs and formaldehyde, building material emission, field measurement, passive

sampling

#### The Energy Efficient Heat Pump System For Office Building In Baltic Region

Yelena Pshenichnaya, Agris Ikaunieks, Agris Ikaunieks

Article Number

Riga Technical University, Riga, Latvia

Keywords: Ground sourced heat pumps, Environmentally friendly projects in Latvia

#### **Critical Moisture Conditions for Mould Growth On Building Materials**

Pernilla Johansson, Gunilla Bok, Annika Ekstrand-Tobin SP Technical Research Institute of Sweden, Boras, Sweden

Keywords: moisture/humidity, micro-organisms, fungi, laboratory test, long term testing

#### **Modelling the Transfer of Gaseous Pollutant through Concrete Slabs**

Marion Musielak, Manuel Marcoux, Michel Quintard Université de Toulouse , INPT, UPS , IMFT (Institut de Mécanique des Fluides de Toulouse), TOULOUSE, France

Keywords: Soil-vapor intusion, VOCs, Modelling, Laboratory Studies

### Diffusion-controlled Reference Material For VOC Emissions Testing: Validation And Application

#### Of A Mass Transfer Model

Zhe Liu, Cynthia Howard-Reed, Steven S. Cox, John C. Little Virginia Tech, Blacksburg VA, United States Keywords: standard source, VOCs

#### Growth Temperature Strongly Influences The Allergenicity Of Aspergillus Fumigatus Spores

Swee-Yang Low, Karen Dannemiller, Maosheng Yao, Naomichi Yamamoto, Jordan Peccia Yale University, New Haven CT, United States

Keywords: airborne allergens, exposure assessment, human IgE binding, gene expresson, mold

#### Implications of Energy Efficiency Improvements on Indoor Radon

Jani Palmer, Laureen Burton

U.S. Environmental Protection Agency, Washington DC, United States Keywords: weatherization, radon, cancer, building science, ventilation

### Evaluation On The Various Type of IAQ Sensors and The Application For The Indoor Air

#### **Management Based On The Sensor Networks**

Dong-won Yoon, Hyo-jun KIM, Sung-min Hong, Nam-chul Sung

Kyungwon University, Sungnam, Korea, Republic of

Keywords: Demand Control Ventilation, Indoor Air Quality, Sensor-Based Control, Energy

Demand with Ventilation, Residential Ventilation System

#### A New IEQ Label for Homes to Accompany the Energy Label

Jaap Balvers, Marco Hofman, Jaap Hogeling, Atze Boerstra, Mieke Weterings BBA Indoor Environmental Consultancy, Rotterdam, Netherlands Keywords: building labeling system, indoor environmental quality, IEQ label, energy certificate, houses and dwellings

#### Indoor Air Quality in Low-Income Homes

Article Number

Bruce E. Tonn, Scott Pigg, Dan Cautley, David Carroll, Paul Francisco, Ken Tohinaka, Michael Blasnik

Energy Center of Wisconsin, Madison WI, United States

Keywords: low-income, residential, radon, formaldehyde, carbon monoxide

#### **Green Buildings, Indoor Air Quality And Health**

Paula Schenck, Paul M. Schur, A. Karim Ahmed
University of Connecticut Health Center, Farmington CT, United States
Keywords: Environmental exposure-adverse effects, illness prevention, guidance and education, policy development

#### **Mercury Emissions From Polyurethane Flooring In Gymnasiums**

Steve Jones, Zhe Liu, John C. Little Virginia Tech, Blacksburg VA, United States Keywords: Sources/emissions

#### Chemistry And Indoor Air Quality In A Classroom

Andreas Fischer, Linda Hägerhed Engman, Evert Ljungström, Sarka Langer University of Gothenburg, Department of Chemistry, Gothenburg, Sweden Keywords: Oxidation products, Field Studies, Schools,

### Measurement Of Indoor Mould Exposure: Development Of A Global Approach Associating

### **Quantitative And Qualitative Tools From Long Duration Air Samplings**

Valérie Bex, Sophie Barral, Adélaide Nieguitsila, Jacques Guillot, Firas Choukri, Vance Bergeron, Stéphane Moularat, Francis Derouinm, Fabien Squinazi Mairie de Paris (Paris Hygiene Laboratory), Paris, France Keywords: airborne fungi, plate-culture techniques, ergosterol, (1,3)-beta-D-glucan, MVOC

# **Evaluation Of A New Device For Fast Detection Of Air Contaminants Using Immunobiological Methods**

Anna Renzl, Wolfgang K. Hofbauer, Thorsten Rennebarth, Wolfgang Koch, Wilhelm Dunkhorst, Hubert Lödding, Katrin Schmitt, Carsten Bolwien, Gerd Sulz, Andreas Holländer, Thorsten Klockenbring, Stefan Barth, Björn Seidel, Peter Muranyi, Klaus Breuer Fraunhofer-Institute for Building Physics, Valley, Germany Keywords: Indoor Air Quality, Microorganisms, Immunobiological Recognition, Fluorescence Microscopy, Human Health

#### Indoor Exposure To PM2.5 In Close Proximity To A Smoker

Viviana Acevedo-Bolton, Wayne R. Ott, Kai-Chung Cheng, Ruo-ting Jiang, Neil E. Klepeis, Lynn M. Hildemann

Stanford University, Stanford CA, United States

Keywords: particulate matter, secondhand smoke, personal exposure,

#### Numerical Analysis On The Effect Of Air Curtain In Creating Non-uniform Indoor Environment

Xiaoliang Shao, Xiaojun Ma, Wei Wu, Xuan Jiang, Xianting Li Department of Building Science, School of Architecture, Tsinghua University, Beijing, China

Article Number

Keywords: Air curtain, Non-uniform indoor air, Numerical simulation, Energy saving

#### Influence Of Toxic Load Effects On Indoor Air Contaminant Exposure Metrics

Jason W. DeGraw, William P. Bahnfleth

The Pennsylvania State University, Architectural Engineering Department, University Park PA, United States

Keywords: toxic load, security metrics, multizone modeling,

# A case-controll study of the effect of indoor environments on health problems of Japanese children, Part 2: Microorganisms and chemical

#### compounds

Kensuke Hamada, Hiroshi Yoshino, Kenichi Hasegawa, Keiko Abe, Koichi Ikeda, Noriko Kato, Kazukiyo Kumagai, Teruaki Mitamura, U. Yanagi, Naoya Ando Tohoku Univ, Sendai City, Miyagi Prefecture, Japan

Keywords: Moisture/dampness, Allergy, Residential,

### Characterizing Emissions Of Di-2-ethylhexyl Phthalate From Vinyl Flooring In A Speciallydesigned Chamber

Zhe Liu, Ying Xu, John C. Little Virginia Tech, Blacksburg VA, United States

Keywords: DEHP, emission chamber, model, sorption

#### Improve Home Air Quality With Source Prediction

Martin L. Spartz

Prism Analytical Technologies, Inc., Mt. Pleasant MI, United States

Keywords: Air Testing, Volatile Organic Compounds, Thermal Desorption Tubes, Asthma,

Residential

### Is It The Building, The Occupant, Or Both? Using The QEESI To Investigate Indoor Air Concerns

Tatjana Walker, Thomas J. Prihoda, Claudia S. Miller

UT School of Medicine at San Antonio, Family and Community Medicine, San Antonio TX, United

Keywords: Hypersensitivity, Surveys, Investigations, Allergy, Toxicology

#### Exposure to phthalates in house dust: Community-based participatory research in a central

#### California county on low-to middle-income older adults with asthma and/or COPD

Derek G. Shendell, Lin Lin, Zhihua (Tina) Fan, Naomichi Yamamoto, Samina S. Mizan, Samuel D. Annor, Christine A. Foster

UMDNJ-School of Public Health, Environmental and Occupational Health, Piscataway NJ, United States

Keywords: asthma, dust, home indoor environment, phthalates, wipe sampling

# Interlaboratory Study Approach To Validate The Performance Of A Prototype Reference Material For Product Emissions Testing

Cynthia Howard-Reed, Zhe Liu, Steve Cox, John Little, Wolfgang Horn, Olaf Wilke, Katharina Wiegner, Andrew Persily

Article Number

National Institute of Standards and Technology, Gaithersburg MD, United States Keywords: test method validation, volatile organic compounds, product certification,

#### Title: A Comparison Of The Characteristics Of ISO Fine Test Dust Versus Real House Dust

Angela Southey, Máire Fox, Tim Yeomans, Bruce Mitchell

Airmid Health Group, Dublin 2, Ireland

Keywords: Vacuum Cleaner, ASTM Standard, Particle Size Distribution, ISO 12103.1 A2,

**Household Dust** 

### Case Study: Microbial Contamination Of Indoor Air In A Kindergarten Due To A Special

#### **Construction Type With A Crawl Space Open To Subsoil**

Wolfgang K. Hofbauer, Thorsten Rennebarth, Anna Renzl, Florian Mayer, Klaus Breuer

Fraunhofer-Institute for Building Physics, Valley, Germany

Keywords: : Indoor Air Quality, Children's Health, Air Spora, Fungi, Mould

#### Automated Evaluation Of Potential Collective Protection Locations Using Multizone Modeling

Jason W. DeGraw, William P. Bahnfleth

The Pennsylvania State University, University Park PA, United States

Keywords: collective protection, multizone modeling, acute events,

# Correlation of aldehyde emissions and fatty acids content in pine wood and oriented strand boards

Katharina Wiegner, Doris Bröedner, Wolfgang Horn

Federal Institute for Materials Research and Testing, Working Group IV.26 Immissions / Organic Compounds in Air", Berlin, Germany

Keywords: VOCs, oxidation products, fatty acid, saturated and unsaturated aldehyde, hexanal

#### Dimensional Analysis Application For Modeling And Prediction of The Indoor Nitrogen Oxides

Silvia Vilceková, Ingrid Šenitková

Technical University of Kosice, Košice, Slovakia

Keywords: Models

# Characteristics of naphthalene and its sources in Edmonton, Alberta residences during winter and summer 2010

Warren Kindzierski, Phyllis Chui, Xiangfei Li, Keith Van Ryswyk, Amanda J. Wheeler, Marie-Eve Héroux, Phil Fellin, Lenora Marro

University of Alberta, Edmonton AB, Canada

Keywords: naphthalene, indoor, IAQ, sources, housing

### Using the USEPA Building Assessment Survey & Evaluation (BASE) Study Data to Challenge

### **Commonly Used Criteria to Interpret Airborne Mold Levels**

Paul E. Haas, Ed Light, Roger Morse, Steve Lattanzio

Morse Zehnter Associates, West Palm Beach FL, United States

Keywords: EPA BASE, Air Sampling, Mold Evaluation, Water Damage

Article Number

#### Reduced Greenhouse Gas Emissions Via Active Energy Recovery Retrofits In Existing Schools

Steven M. Caulfield, William A. Turner, Stephen Nelson, Matt Cashman, Jeffrey J. Harrison Turner Building Science & Design, LLC, Harrison ME, United States Keywords: school ventilation costs, active energy recovery, frictionless" magnetic bearing compressor", air emissions reduction, ARRA Funding

#### Exposure to exhaled air from a sick occupant in a two-bed hospital room with mixing

### ventilation: effect of distance from sick occupant and air change rate

Zhecho D. Bolashikov, Arsen K. Melikov, Emanuil Georgiev

Technical University of Denmark, Department of Civil Engineering, ICIEE, Kgs. Lyngby, Denmark

Keywords: Hospital rooms, airborne cross-infection, exposure, breathing

#### Assessment of Indoor Air Quality Benefits and Energy Costs of Mechanical Ventilation

Jennifer M. Logue, Max H. Sherman, Brett C. Singer, Price Phillip Lawrence Berkeley National Lab, Berkeley CA, United States Keywords: Residential, DALYs, ASHRAE 62.2, California, Title 24

#### **Spreadsheet-Based Tool for Exposure Screening**

Peter P. Egeghy, Melissa C. Nysewander

U.S. Environmental Protection Agency, National Exposure Research Laboratory, Research Triangle Park NC, United States

Keywords: Exposure - Multi-route, Methods - Models, Other - Chemical Screening,

# Effects Of Flooding On Preexisting Mold Spores Within Drywall Sold By Distributors - Results of a Two-Year Study

Felicia L. Cianciarulo, Paul E. Haas, Kimberly Schneider, Praewpannarai Buddadhumaruk, Bob Wendt

Morse Zehnter Associates, West Palm Beach FL, United States

Keywords: Effects of floods, building materials, water damage, mold growth

### Carbondioxide Measurements - An Indicator Of Hidden Microbial Damages In Buildings

Roy W. Norborg, Bengt S. Wessén

Pegasus laboratory, Uppsala, Sweden

Keywords: Mold, Wood rotting fungi, SBS, Damp building, Case study

# Characterization of HVAC Filter Cake Composition and Ozoneinitiated Heterogeneous Chemistry

Meera A. Sidheswaran, Regina N. Williams, Lara A. Gundel, Melissa M. Lunden, William J. Fsk, Michael G. Apte, Hugo Destaillats

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United States

Keywords: HVAC filters, Ozone reaction, Terpeneol, filter characterization

### Human Illness From Indoor Exposure To Outdoor Emissions From Natural Gas Field Emissions -

#### **Case Report**

Alisa Rich, William J. Rea, Vatsalya Shukla

Article Number

Wolf Eagle Environmental, LLC, Flower Mound TX, United States

Keywords: Symptomatology, Sources/emissions, VOCs,

# Tracking the Effects of Moisture Content within various Building Materials before and After an HVAC Improvement Project

Matthew Divine, Paul E. Haas, Roger Morse, Steve Lattanzio

Morse Zehnter Associates, West Palm Beach FL, United States

Keywords: Wireless Monitoring, Moisture Content, Building Science, Dehumidification, HVAC

#### Modeling Population Exposures to Pollutants Emitted from Natural Gas Cooking Burners

Agnes Lobscheid, Neil Klepeis, Brett Singer

Lawrence Berkeley Laboratory, Berkeley CA, United States

Keywords: gas appliances, indoor air modeling, nitrogen dioxide, carbon monoxide

#### Study On Air Pollution From Burning Of Incense In Temples

Jinping Zhang, Yinping Zhang

Tsinghua University, Beijing, China

Keywords: Temple, Burning of incense, Particles, Volatile orgainic compounds

# Passive Survivability: Reducing The Impact Of Extreme Weather Events On Built Environments And Public Health

Terry Brennan, Alex Wilson, Christopher Patkowski

Camroden Associates, Inc., Westmoreland NY, United States

Keywords: passive design, emergency shelter, weather events, power distribution failure

#### **Reclassifying Hotel Room Exhaust**

William Bradford M. Stanley, Bryan K. Ligman

AAF International, Doraville GA, United States

Keywords: Air Cleaning, Energy, Field Studies, IAQ, Chemical Filtration

# First Experimental Results Comparing a Photolytic Versus Photocatalytic Reactor Working In Real Indoor Air Conditions

Marta Sanchez- Muñoz, Benigno Sanchez, Maria Muñoz-Vicente, Fernando Feldman

CIEMAT, Energy, Madrid, Spain

Keywords: Air cleaning, Bioaerosols treatment, Photolysis, Photocatalysis, Realistic operations

#### Solid-fuel Cook Stoves: Fuel Efficiency And Emissions Testing

James Jetter

U.S. EPA, Research Triangle Park NC, United States

Keywords: cook stove, developing countries, laboratory testing, air pollutant emissions, fuel efficiency

Exposure Assessment Of Indoor And Outdoor Community and Personal BTEX Exposures To

Workers On The Saint Regis Mohawk Tribe (SRMT) Reservation At Akwesasne

Alan Rossner, Philip K. Hopke, Angela Benedict-Dunn, Ryan Lebouf, Sheila Kalenge

Article Number

Clarkson University, Institute for a Sustainable Environment, Potsdam NY, United States Keywords: Benzene, Risk assessment, Air toxics, TO-15, Canister sampling

### Sources And Characteristics Of Cultivable And Uncultivable Microbial Diversity In Indoor Environment

Miia J. Pitkäranta, Helena Rintala, Lars Paulin, Petri Auvinen, Aino Nevalainen University of Helsinki, Institute of Biotechnology, Helsinki, Finland Keywords: Bioaerosol, House dust, Fungi, Bacteria, Molecular methods

#### Investigation Of Indoor Air Quality Of The Residences In Beijing, China

Jinping Zhang, Lixin Wang, Jan Sundell, Yinping Zhang
Tsinghua University, Beijing, China
Keywords: Indoor air quality (IAQ), Investigation, formaldehyde, volatile organic compounds,
Questionnaire

# Assessment Of Indoor Air Quality In Different Environments And Subjective Symptoms Associated With Sick Building Syndrome

Adriana Gioda, Maria da Conceição, Klaus V. Ramos, Francisco Radler de Aquino Neto Pontifical Catholic University of Rio de Janeiro, Chemistry, Rio de Janeiro, Brazil Keywords: Printing facility, BTX, VOCs, Formaldehyde, Acetaldehyde

#### Study Of Ergonomics Towards Improving Health And Comfort Of A Workplace

Aliyu S. Shika, Abdulsalam Dalhatu, Shehu Ahmed Bustani A.BU Zaia- Nigeria, Building, Zaria Nigeria, Nigeria Keywords: Ergonomics, Indoor air quality, Performance levels, Environmental health, safety

#### **Efficacy Assessment of A Managed Program For Mold Prevention In Buildings**

Elliott Horner, Tony Worthan, Nate Sanders
Air Quality Sciences, Inc, Marietta GA, United States
Keywords: moisture management, building science, cost benefit, green sustainable buildings

#### **Essential Knowledge Of Indoor Microbial Ecology**

Ming-Ching Liang, LeeAnn Kahlor The University of Texas at Austin, Advertising, Austin TX, United States Keywords: indoor environment, microbiology, policy, content analysi

#### Air And Light Modulation In Architectural Facades

Matt Fajkus, Dason Whitsett
The University of Texas at Austin, Austin TX, United States
Keywords: Passive Daylighting, Passive Cooling, Filtration, Interdisciplinary Collaboration

# Impacts Of Activated Carbon Surface Modification On Low Molecular Weight Gas-phase Aldehyde Adsorption For Indoor Relevant Conditions

Ellison M. Carter, Lynn E. Katz, Gerald E. Speitel Jr. University of Texas at Austin, Austin TX, United States

Article Number

Keywords: Chemistry, Transport processes, Air cleaning, Healthy homes, buildings, and communities

#### Green Building Rating Systems and Indoor Air Quality (IAQ) Credits

Jelena Srebric

The Pennsylvania State University, Architectural Engineering, University Park PA, United States Keywords: Green and sustainable buildings, Building rating systems, IAQ credits,

#### Exposure To Fungi Liberated From Paper-clay In A Pottery Fabrication Studio

John T. Gyger, Mary Kay O'Rourke, Mark Van Ert

The University of Arizona, Environmental Health Sciences, Tucson AZ, United States

Keywords: Paper-clay, Fungi, Artist Studio, Bioaerosols, Fabrication process

# Relation between Occupant Satisfaction and Window Operation Opportunity as well as Building Size in Office Buildings in Korea

YoonWha Yom, ChungYoon Chun, RoYeul Kwak, BoYoung Kim

Yonsei University, Seoul, Korea, Republic of

Keywords: Project and facilities management/maintenance, Surveys, User/occupant control of indoor environment,

# Thermal Comfort In Transitional Metabolism Based On Subjective Experiments With Ceiling Supply Task Conditioning System

Takashi Akimoto, Hitoko Ohta, Satoshi Hashimoto, Atsushi Nishino, Tomoyuki Chikamoto, Shinji Nakamura

Shibaura Institute of Technology, Department of Architecture and Building Engineering, Tokyo, Japan

Keywords: Thermal Comfort, Transitional Metabolism, Subjective Experiment, Ceiling Supply, Task Conditioning System

### Removal Of Indoor Secondary Organic Aerosols By Negative Air Ion Generator

Chi-Chi Lin, Kuo-Pin Yu, Sheng-Chun Yang

Institute of Environmental and Occupational Health Sciences, National Yang-Ming University, Taipei, Taiwan

Keywords: Biogenic volatile organic compound, Clean air delivery rate, Electric field strength,

#### Copper Heat Exchangers for Improving Indoor Air Quality: Cooling Season at Fort Jackson

Charles Feigley, Charles Feigley, Liv Haselbach, Jim Hussey, Jamil Khan, Sasan Jahanian, Harold Michels, Deborah Salzberg1, Michael Schmidt

University of South Carolina, Columbia SC, United States

Keywords: HVAC, copper, antimicrobial, air conditioning

### Retrospective Formaldehyde Exposure Assessment Of FEMA Temporary Housing Units

Srinandini Parthasarathy, Randy L. Maddalena, Michael Spears, Marion Russell, Michael G. Apte University of California Berkeley, Environmental Health Sciences, Berkeley CA, United States Keywords: formaldehyde, temporary housing units, retrospective exposure assessment, indoor air

Article Number

# Impact Prediction of Exhaust Gas on the Air Supply Opening by the Latent Heat Condensing Boilers in the Common Spaces of the Multifamily Housings

Yasutoshi Shimizu

Tokyo Gas Co.,Ltd., Tokyo, Japan

Keywords: Multi-family Housings, Latent Heat Condensing Boiler, Air Supply Vents, Exhaust Gas,

Developing Policy For Equipment Installation Stand

#### Measured Ventilation Rates In Minnesota Bars And Restaurants

David T. Grimsrud, David L. Bohac, Martha J. Hewett, Kristopher I. Kapphahn

University of Minnesota, St Paul MN, United States

Keywords: Ventilation, CO2 Tracer Gas, Field Study, Bars and Restaurants, Societal Imperatives

### Ventilation And Indoor Air Quality In 40 Small And Medium Sized Commercial Buildings In

#### **California: Ventilation Measurements Methods And Findings**

Michael G. Apte, Deborah H. Bennett, David Faulkner, Michael Spears, Douglas P. Sullivan, Amber L. Trout, Xiangmei (May) Wu

University of California, Davis, Department of Public Health Sciences, Davis CA, United States Keywords: HVAC, ventilation rate, air exchange rate, mechanically supplied outdoor air

# Enhancing The Performance Of Modularised Fan Coil Units Using The Concept Of Single Coil Twin Fan System

Chandra Sekhar, Kwok Wai Tham, David Cheong

National University of Singapore, Singapore, Singapore

Keywords: Fan coil unit, Classrooms, Enhanced IAQ,, Decoupled ventilation,, Hot and humid climate

#### Selection And Use Of Unvented Gas Fireplaces: Homeowner Survey Results

Mona Azarbayjani, Paul Francisco, Jeffrey Gordon, William Rose

University of Illinois at Urbana-Champaign, Building Research Council, Champaign IL, United States

Keywords: unvented heating, residential buildings, survey,

# Can commonly-used active air cleaning technologies improve indoor air quality? A literature review

Yinping Zhang, Jinhan Mo, Yuguo Li, Jan Sundell, Pawel Wargocki, Jianshen Zhang, John C. Little, Richard Corsi, Qihong Deng, Michael K.H. Leung, Lei Fang, Wenhao Chen, Jinguang Li, Yuexia Sun Tsinghua University, Beijing, China

Keywords: Indoor air quality (IAQ), air cleaner, by-product, clean air delivery rate (CADR)

#### Significance Of Two-way Airflow Effect Due To Temperature Difference In Indoor Air Quality

Chun Chen, Bin Zhao, Xudong Yang

Tsinghua University, Department of Building Science, Beijing, China

Keywords: Positive pressure, Hospital infection, Outdoor particle, Multi-zone model, SARS

Article Number

# Identification of Mould Fungi by Combining Blast-based Similarity Searches and Phylogenetic Analysis

Gunilla G V Bok, Henrik Nilsson

SP Technical Research Institute of Sweden & Gothenburg University, SP Enegy Technology & Department of Plant and Evironmental Science Gothenburg University, Borås, Sweden Keywords: Microflora, biodiversity, building materials, identification, species

#### The Role Of Material Porosity On Ozone Uptake For Metakaolin-concrete Surfaces

Sarah C. Taylor Lange, Clément Cros, Maria CG Juenger, Jeffrey Siegel, Dustin Poppendieck University of Texas, Austin, Civil, Architectural and Environmental Engineering, Austin TX, United States

Keywords: Deposition velocity, Reaction Probability, Heterogeneous Chemistry, Construction Materials

# Evaluating Damp Houses with the Environmental Relative Moldiness Index (ERMI) and Fungal PCR: A Review of the Epidemiologic Evidence

Mark J. Mendell

California Dept. of Public Health, Indoor Air Quality Section, Richmond CA, United States Keywords: fungus, mold, respiratory health,

#### **Catalytic Oxidization Of Formaldehyde Under Room Temperature**

Jingjing Pei, Jianshun Zhang, William Chadwick, Eric Adams Syracue University, Syracuse NY, United States Keywords: Formaldehyde, Catalytic oxidization, Relative humidity, Mass transfer, Indoor air quality

### Potential Sources Of Phthalate Exposure In A Vancouver Birth Cohort At Three Months Of Age

Huan Shu, Ryan Allen, Michael Brauer, Roxanne Rousseau, Stuart Turvey, Tim K. Takaro Faculty of Health Sciences, Simon Fraser University, Burnaby BC, Canada Keywords: Environmental justice, moisture/dampness, ingestion, personal care products

### Stove Stacking: the Integration of the Justa Cookstove in one Rural El Salvadoran Community Aaron Redman

Arizona State University, Tempe AZ, United States

Keywords: improved cookstoves, fuel stacking, energy ladder, case study, livelihood strategy

#### Comparison Of HVAC Filter Test Methods For Particle Removal Efficiency

Brent Stephens, Jeffrey A. Siegel

The University of Texas at Austin, Civil, Architectural and Environmental Engineering, Austin TX, United States

Keywords: particulate matter, MERV, filtration, field measurements, residential air-conditioning

# Selection of appropriate chamber and introduction of comparative sources in normative sensory evaluation method for building products in Japan

Jonghun Kim, Shinsuke KATO, Minki SUNG The University of Tokyo, Tokyo, Japan

Article Number

Keywords: perceived air quality, building material odor, perceived intensity, panel test, sensory measurements

#### Indoor Air Quality In Weatherization Homes: Study Design And Pilot Results

Paul W. Francisco, Daniel Cautley, Ken Tohinaka, Scott Pigg, Bruce Tonn, David Carroll University of Illinois at Urbana-Champaign, Champaign IL, United States Keywords: protocol development, retrofit, residential buildings, measurement

#### Physiological And Sensory Human Response To IEQ Indicators While Asleep

Jelle Laverge, Arnold Janssens Ghent University, Ghent, Belgium

Keywords: IEQ, sleep, human response, temperature, light

# Simulation of Indoor Volatile Organic Compounds (VOCs) Concentrations under Different Air Changes per Hour (ACH)

Weihui Liang, Xudong Yang Tsinghua University, Department of Building Science, Beijing, China Keywords: VOCs, indoor air quality, simulation,

#### Modelling Indoor Climate in Classroom with Different Air Distribution Methods

Panu Mustakallio, Risto Kosonen Oy Halton Group Ltd, Kausala, Finland

Keywords: School, Ventilation effectiveness, Mechanical ventilation,

#### Validation of Unsteady CFD Analysis with Actual Measurement in a Room with Floor Heating

Koji Sakai, Hiroki Ono, Ryoichi Kajiya

Meiji University, Dept. of Architecture, Kawasaki, Japan

Keywords: Floor heating, Natural convection, Unsteady, Experiment, CFD

### Yields of Secondary Organic Aerosol from Reactions between Ozone and Surface-Adsorbed d-

Michael S. Waring, Jeffrey A. Siegel

Drexel University, Civil, Architectural and Environmental Engineering, Philadelphia PA, United States

Keywords: Oxidation chemistry, Terpenes, SOA yields, Particle formation, Deposition velocity

# Measurement And CFD Of Heat Loss Caused By Stirring Movement Of Automatic Revolving Door

Hiroki Ono, Koji Sakai

Meiji University, Kawasaki, Japan

Keywords: Automatic revolving door, Air exchange rate, Measurement, Moving mesh CFD, GGI

#### **Investigation Of Appropriate Ventilation Rates For Retail Stores**

David T. Grimsrud, Neil Carlson, Barry B. Bridges, Tony Springman, Scott D. Williams University of Minnesota, St Paul MN, United States

Article Number

Keywords: Field Study, Particles, Ventilation, VOCs, Standards

### Estimating The Proportion Of Fine Particulate Ambient Air Pollution (PM2.5) Attributable To

#### **Household Fuel Use For Cooking In Asia**

Zoe A. Chafe, Sumi Mehta, Kirk R. Smith

UC Berkeley, Energy and Resources Group, Berkeley CA, United States

Keywords: Particles, Developing Countries, Energy, Household cooking

# Eczema and PVC as flooring material in early childhood is related to the development of Asthma and Rhinitis

Laura von Kobyletzki, Åke Svensson, Fredrik Lundin, Mikael Hasselgren, Carl-Gustaf Bornehag, Malin Larsson

Karlstad University, Department of Public Health Sciences, Karlstad, Sweden

Keywords: atopic dermatitis, children, asthma, rhinitis

#### Indoor Air Problems Among Employees At A Hotel In Copenhagen

Gitte J. Holst, Henrik Harboe, Torben I. Sigsgaard

Department of Environmental and Occupational Medicine, Aarhus University, Aarhus, Denmark Keywords: environmental tobacco smoke, interaction smoking and ozone, hotels,

#### Impact of air temperature, relative humidity, air movement and pollution on eye blinking

Arsen K. Melikov, Velina Lyubenova, Mariusz Skwarczynski, Jan Kaczmarczyk

Intern. Centre for Indoor Environment & Energy, Dep of Civil Engineering, Techn. Univ. of

Denmark, Kgs. Lyngby, Denmark

Keywords: Eye blink frequency, air movement, individual control, air temperature, air pollution

### **Characteristics Of BTEX In Campus Indoor Environments**

Meilin Yan, Na Luo, Xiaotu Liu, Zhaorong Liu

Peking University, Beijing, China

Keywords: BTEX, concentration, I/O ratio, campus microenvironments

#### Effects of Air movement on Thermal Comfort in Warm and Humid Climates

Meilan Tan, Baizhan Li, Hong Liu, Qing Tan

Chongqing University, Faculty of Urban Construction and Environmental Engineering, Chongqing,

China

Keywords: Thermal comfort

### Effect Of Individual Control Of Airflow From Task Fan On Task Performance, Fatigue And

### **Cerebral Blood Flow**

Naoe Nishihara, Shin-ichi Tanabe

Waseda University, Tokyo, Japan

Keywords: Productivity, Thermal environment, Subjective experiment, Cerebral blood flow,

**Fatigue** 

#### Survey on Actual Status of Sanitary Environments and Maintenance for Buildings

Article Number

Koichi Ikeda, Haruki Osawa, Naoki Kagi, U Yanagi, Kenichi Azuma, Hideki Saito, Ryota Kamakura College of Sci. & Tech. Nihon University, Architecture, Tokyo, Japan

Keywords: Building maintenance Law, Revision, Energy saving measures, IAQ, Illegal case

#### Year-round Energy Saving Potential For A Stratum Ventilated Subtropical Classroom

C. K. Lee, John Z. Lin, K F Fong

City University of Hong Kong, Kowloon, Hong Kong

Keywords: Stratum ventilation, mixing ventilation, displacement ventilation, annual energy

saving, TRNSYS simulation

#### Psychological and Physiological Response in Vehicle under Summer Condition

Shinichi Yoshimura, Yuji Mori, Hajime Oi, Shin-ichi Tanabe, Yutaka Kobayashi Waseda University, Architecture, Tokyo, Japan

 $Keywords: model, CFD, Numerical\ thermoregulation\ model,\ psychological\ estimation,\ subjective$ 

test

#### Microbial Exposures Indoors - Links To Health In Good And Bad

Aino I. Nevalainen, Helena Rintala, Miia Pitkäranta, Päivi Kärkkäinen, Maria Valkonen, Hanna Leppänen, Pasi Kaarakainen, Ulla Lignell, Martin Täubel, Juha Pekkanen, Anne Hyvärinen National Institute for Health and Welfare, Department of Environmental Health, Kuopio, Finland Keywords: residential, measurements, biological, allergy

#### Developing An Analytical Model For The Settling Of Lognormal Size Distributed Particles

Tobias Schripp, Sebastian Willenborg, Tunga Salthammer

Fraunhofer Wilhelm-Klauditz-Institut, Material Analysis and Indoor Chemistry, Braunschweig, Germany

Keywords: particle deposition, slip correction, soiling,

# Evaluation Of Personal Exposure To Environmental Tobacco Smoke In Daily Life - Field Survey Study -

Miyuki Noguchi, Keiichi ARASHIDANI, Yukio AKIYAMA, Yoshiaki ISHIZU, Takashi AMAGAI, Takeshi OOURA, Hideaki MATSUKI, Satoshi NAKAI, Yukio YANAGISAWA

The University of Tokyo, Chiba, Japan

Keywords: separation of smoking, suspended particle matter, TVOC, carbonyl compounds, nicotine

# Ultrafine Particle Removal Efficiency For Portable Air Cleaner By Using Large-scale Chamber Method

Naoki Kagi, U. Yanagi, Sahori Ishioka, Megumi Endo, Kenkichi Kagawa, Junji Matsushima National Institute of Public Health, Saitama, Japan

Keywords: Indoor air quality, Particulate pollution, Clean air change rates, Nano particle, WPS

### Exposure Assessment of Nanoparticles in a TiO<sub>2</sub> Manufacturing Laboratory

Gwi-Nam Bae, Seung-Ho Park, Jae-Hee Jung, Seung-Bok Lee Korea Institute of Science and Technology, Seoul, Korea, Republic of Keywords: exposure assessment, titanium dioxide, nanopowder, workplace Article Number

# FRESH: Effects Of A Ventilation Intervention In Classrooms Upon Cognitive Performance And Respiratory Health Of Primary School Pupils

Jeannette Rosbach, Machiel Vonk, Frans Duijm, Jan van Ginkel, Bert Brunekreef Utrecht University/GGD Groningen, IRAS (Institute for Risk Assessment Sciences), Groningen, Netherlands

Keywords: Ventilation, Schools, Performance, Respiratory

#### On-Site Odour Analysis and Assessment-- Method And Case Studies

Jörg Thumulla, Carmen Kroczek anbus analytik GmbH, Fürth, Germany

Keywords: Panel, guideline, indoor odour measurement, sensory evaluation, odour intensity

#### Volatile Organic Compound Concentrations and Estimation of Optimal Source Strengths to

#### Achieve a High Level of Acceptance Indoors using Multi- Zone Simulation

Helena K. Järnström, Cynthia Howard-Reed, Stuart Dols, Andrew Persily VTT, Espoo, Finland

Keywords: VOC, formaldehyde, building simulation, multi-zone model

### **Quaternary Ammonium Compounds--Case Studies And Sampling Methods**

Carmen Kroczek, Jörg Thumulla anbus analytik GmbH, Fürth, Germany

Keywords: dialkyldimethyl-ammonium compounds (DDAC)), benzylalkyl-dimethylammonium compounds (BAC), cationic surfactants, decontamination, mold

# The Emerging Role For Industrial Hygienists As A Result Of The Implementation Of Environmental Air Monitoring Guidelines For Facilities That Manufacture Sterile Drug And Biological Products.

David Hunt, Lan Chi Nguyen Weekes, Donald Weekes InAIR Environmental Ltd., Ottawa ON, Canada

Keywords: field study, standards, guidelines, assessment methodology,

#### **Odorous Emissions Of Polyurethane Raw Materials And Parts**

Michael Rampfl, Florian Mayer, Klaus Breuer, Dieter Holtkamp Fraunhofer Institute for Building Physics, Valley, Germany Keywords: VOCs, Odor, Measurements,

#### The Risk Assessment Of Benzene And Formaldehyde In Residential Units In Shenzhen, China

Chao Wang, Xudong Yang, Bin Zhao, Fengna Chen, Sheng Wang Tsinghua University, Department of Building Science, Beijing, China Keywords: Field test, Exposure, Comparison,

# Bioaerosol Sampling With The Wetted Wall Cyclone In A Laboratory And Different Indoor Environments

Maria D. King, Asmaa S. Kassab, John S. Haglund, Andrew R. McFarland

Article Number

Texas A&M University, Department of Mechanical Engineering, College Station TX, United States Keywords: Bioparticle collection, archived cell viability, DNA intactness, environmental sampling, fungal spore movement

### Development Of An Environmental Particle Collector System For Continuous Sampling Of Ultrafine Aerosols

Maria D. King, Victor M. Ugaz, John S. Haglund, Alexzander A. Asea, Yassin A. Hassan Texas A&M University, Department of Mechanical Engineering, College Station TX, United States Keywords: Ambient nanoparticles, Titanium dioxide, wetted wall cyclone (WWC), microchannel, particle-dye interaction

#### Corrosion coupons may not be useful for predicting data center equipment failure rates.

Taewon Han, Henry Coles, William Tschudi, Ashok J. Gadgil, Phillip Price Lawrence Berkeley National Laboratory, Berkeley CA, United States Keywords: copper corrosion rate, silver corrosion rate, contamination, air-side economizer, corrosion coupon

# Effect Of Ovalbumin And Anti-foam B On The Survivability Of Spore Forming Bacteria Collected In A Wetted Wall Cyclone

Asmaa Kassab, Maria D. King, Bing Guo, Andrew R. McFarland Texas A&M University, Mechanical Engineering, College Station TX, United States Keywords: Biosampler, Bacillus globigii, Archiving,

# Emission Rates of Pollutants Emitted from a Traditional and an Improved Wood-burning Cookstove

Thomas W. Kirchstetter, Odelle L. Hadley, Chelsea V. Preble, Ashok J. Gadgil Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division, Berkeley CA, United States

Keywords: cookstoves, Berkeley-Darfur Stove, three-stone fire, particulate matter, carbon monoxide

#### **Energy Implications of Residential Particle Control Technologies**

Jeffrey A. Siegel

The University of Texas at Austin, Austin TX, United States

Keywords: particulate matter, CADR, HVAC filtration, portable filters, ventilation

#### **Evaluation of Air Distribution Systems Using a New Air Distribution Index**

Issa F. Almesri, Hazim B. Awbi

University of Reading, School of Construction Management and Engineering, Reading, United Kingdom

Keywords: Thermal comfort, Indoor air quality, Mixing ventilation, Displacement ventilation, Ventilation performance

#### **Efficiency Of Dust Control Methods On Dustiness In New Building Constructions**

Pertti O. Pasanen, Vesa E. Asikainen, Pentti Kalliokoski University of Eastern Finland, Department of Environmental Science, Kuopio, Finland

Article Number

Keywords: dustiness, dust control, building construction, quartz, exposure

# Occupant Comfort, Productivity, And Personal Control In Twenty Air Conditioned Office Buildings

Jared Langevin, Jin Wen, Sean Hsieh, Davor Novosel, Michael S. Waring

Drexel University, Civil, Environmental, and Architectural Engineering, Philadelphia PA, United States

Keywords: Occupant Satisfaction, Comfort Adaptation, High Performance Buildings,

#### Indoor Air Quality In Retail Buildings: A Review

Joshua D. Rhodes, Eléna Nirlo, Jelena Srebric, Jeffery Siegel University Of Texas - Austin, Austin TX, United States Keywords: Commercial buildings, VOCs, SVOCs, Particles

# The Impact Of Traffic-related Air Pollutants On Indoor Air Quality At Four Elementary Schools In El Paso, Texas With Different Air Conditioning Systems

Thomas H. Stock, Wen-Whai Li, Jeremy A. Sarnat, Amit U. Raysoni, Hector A. Olvera, Stefanie E. Sarnat, Holguin Fernando

Univ. of Texas SPH, Div. of Epidemiology, Human Genetics and Environmental Sciences, Houston TX, United States

Keywords: asthma, traffic emissions, indoor/outdoor air,

#### **Modeling of Urban Wind for Infiltration Studies**

Brendon Burley, Jelena Srebric, Sue Ellen Haupt, Leonard J. Peltier, Jiying Liu The Pennsylvania State University, University Park PA, United States Keywords: infiltration, urban terrain zone, computational fluid dynamics, sheltering effects, wind pressure coefficients

# Contributions Of Indoor And Outdoor Sources To Indoor Air VOC Concentrations In Houston Exposure To Air Toxics Study (HEATS) Homes

Jaymin Kwon, Thomas H. Stock, Maria T. Morandi

University of Texas Health Science Center at Houston, Environmental and Occupational Health Sciences, Houston TX, United States

Keywords: VOCs, Residential, Sources/emissions, Field studies

# Comparison Of Microenvironmental VOC Concentrations In The Houston Exposure To Air Toxics Study (HEATS) Homes

Maria T. Morandi, Thomas H. Stock, Ron Harrist, Jaymin Kwon, Roy Whitmore, Michael Phillips University of Texas Health Science Center at Houston, Environmental and Occupational Health Sciences, Houston TX, United States

Keywords: Exposure Inhalation, Field studies, VOCs, Sources/emissions

### A Review of ASTM D7391-09

Standard Test Method for Categorization and Quantification of Airborne Fungal Structures in an Inertial Impaction Sample by Optical Microscopy

James R. Tucker

Article Number

Environmental Monitoring Systems, North Charleston SC, United States Keywords: Impactor, fungus, mold, optical microscopy, analytical method

#### Indoor Radon Exhalation Rates From Concrete With Fly Ash

Sarah C. Taylor Lange, Maria CG Juenger, Jeffrey A. Siegel University of Texas, Austin, Austin TX, United States

Keywords: Radioactive Pollution, Radon-222, Radium-226 activity, Supplementary Cementitious

Materials

### Ventilation And Indoor Air Quality In 40 Small And Medium Sized Commercial Buildings In

#### **California: Indoor Air Quality Methods And Findings**

Deborah L. Bennett, Michael Apte, May Wu, Amber Trout, Dave Faulkner, Randy Maddalena University of California, Davis, Department of Public Health Sciences, Davis CA, United States Keywords: volatile organic compounds, particulate matters

#### **Set Point Temperature And Adaptive Principal**

Shin-ichi Tanabe, Mari Yamamoto

Waseda University, Department of Architecture, Tokyo, Japan

Keywords: Thermal comfort, adaptive model, sustainable building, cool biz, HVAC

#### Use Of House Dust And Soil Ratios To Prioritize Elements For Future Air Quality Investigations

Paloma I. Beamer, Michelle D. Kelly, Anastasia Sugeng, David W. Layton University of Arizona, Environmental Health Sciences, Tucson AZ, United States Keywords: metal contaminants, indoor air pollutants, crustal tracers,

# Alternatives to Manual Counting for Detection and Identification of Airborne Fungal and Actinomycete Spores

Janet M. Macher, Kadra Gulaid, Kaveh Hemati, Sutapa Ghosal, Jeff Wagner, Kazukiyo Kumagai, Stephen Wall

California Department of Public Health, Richmond CA, United States

Keywords: fungal identification, automated analysis, microscopy, Raman micro-spectroscopy, monodisperse aerosol

#### The Effect Of Climate Change On Indoor Environmental Quality

Menghao Qin

Nanjing University, Nanjing, China

Keywords: Climate change, Indoor environmental quality, Building energy consumption,

#### Confidence In Olfactometry Measurement Depending On Number Of Subject

Toshio Yamanaka, Akihisa Takemura, Kazunobu Sagara, Hisashi Kotani, Yoshihisa Momoi Osaka University, Graduate School of Engneering, Department of Global Architecture, Osaka, Japan

Keywords: odor, subjective evaluation, category scale, Confidence interval

#### Altered Air Flow And Ventilation Caused By Operation Of Radon Control Systems

Article Number

Bradley Turk, Jack Hughes

Environmental Building Sciences, Inc., Las Vegas NM, United States

Keywords: Active soil depressurization, Moisture, Indoor environmental quality, Air leakage,

Energy

#### National Programs To Assess IEQ Effects Of Building Materials And Products

Hal Levin

Building Ecology Research Group, Santa Cruz CA, United States

Keywords: Emissions Testing, VOCs, Certification, Labelling, National Emission Test Programs

#### **Evaluation Of Acoustic Performance In Green Building Certification Systems**

Nurgün Tamer Bayazit, Bilge San, Gizem Ökten

Istanbul Technical University, Istanbul, Turkey

Keywords: Indoor environmental quality, Certification systems, Acoustics,

# Reproduction of malodor Emitted from Automobile Air Conditioner Using Laboratory-scale Cooling System

Young-Jae Yu, Ik-Hee Lee, Man-Goo Kim

Kangwon National University, Department of Environmental Science, Chun-cheon, Korea,

Republic of

Keywords: evaporator, volatile organic compounds, solvent extraction, microbial metabolism

#### Study On The Adsorptive Removal Of Carbon Dioxide In Testing Chamber

Youngmin Cho, Soon-Bark Kwon, Duck-Shin Park, Woo-Sung Jung, Gwi-Nam Bae

Korea Railroad Research Institute, Railroad Environment Research Department, Uiwang-si, Korea,

Republic of

Keywords: CO2, Adsorbent, Indoor Air, Ventilation

#### Performance Of Low VOC Specifications In Europe And In The Usa

Reinhard Oppl, Roland Augustin

Eurofins Product Testing A/S, Galten, Denmark

Keywords: VOCs, Certification/labeling, Standards, guidelines, codes, Healthy homes, buildings

and communities, Regulations

### Experimental Study on thermal effect between ceiling and floor in large space with

#### displacement ventilation

Xin Wang, Chen Huang, Weiwu Cao, Xuelei Gao, Yu Hu

University of Shanghai for Science and Technology, Shanghai, China

Keywords: Experimental results, DV system, thermal effect, temperature gradient, cooling load

#### An Assessment of the indoor Air Quality at Child Care Centers In South Korea

Jong ryeul Sohn, Jung tae Kwon, Yoon yong Jou, Hyun hee Park, Youn hee Oh

Korea Univ., Seoul, Korea, Republic of

Keywords: formaldehyde, TVOC, TBC, PM10, IAQ

Article Number

#### Novel ventilation strategy for reducing the risk of airborne cross infection in hospital rooms

Arsen K. Melikov, Zhecho D. Bolashikov, Emanuil Georgiev

Technical University of Denmark, Department of Civil Engineering, ICIEE, Kgs. Lyngby, Denmark Keywords: Airborne cross-infection, breathing, hospital room, advanced ventilation, mixing ventilation

# Composite PCMs using xGnP as energy saving building materials for thermal comfort of residential building using radiant floor heating system

Jong ryeul Sohn, Jung tae Kwon, Yoon yong Jou, Hyun hee Park, Youn hee Oh Building Environment & Materials Lab, School of Architecture, Soongsil University, Seoul, Korea, Republic of

Keywords: Phase change materials(PCM), thermal energy storage, thermal comfort, microencapsulated PCM, building energy consumption

# VOC Emissions Behavior From Car Interior Parts according to Sample Loading Types In 1 m<sup>3</sup> Test Chamber

Man-Goo Kim, Young-Jae Yu, Mark W. Pharaoh, Chul-Soon Park

Kangwon National University, Dept. of Environmental Science, Chunchon, Korea, Republic of Keywords: Car trim interior, Volatile Organic Compounds, VDA 276, Chamber test, Emission

#### **Evaluation Of The Adsorption Performance Of Graphite about Indoor Toxic Substances**

Jeong-Hun Lee, Junhyun Kim, Sumin Kim

Building Environment & Materials Lab, School of Architecture, Soongsil University, soeul, Korea, Republic of

Keywords: formaldehyde, VOCs, graphite, expanded graphite, exfoliated graphite

### Formaldehyde And VOCs Detection For Smart Building Ventilation

Catherine Thibaud-Erkey, Marcin Piech, Sameh Dardona, Joe Mantese United Technologies Research Center, Physical Sciences /Environmental Sciences, East Hartford CT, United States

Keywords: VOC detection, FAIMS detection, smart ventilation,

#### Building Integrated Latent Heat Cold Storage For Air-to-Air Air-conditioning Systems

Pavel Charvat, Milan Ostry

Brno University of Technology, Brno, Czech Republic

Keywords: air-conditioning, cold thermal storage, phase change materials,

#### Modeling And Computer Simulation Of Ultrafine Particles Generated From Laser Printers

Yoshihide Suwa, Shuji Fujii, Namiki Norikazu, Naoki Kagi, Kazuhiro Sekiguchi, Kenichi Azuma, Hajime Tamura

Tokyo Institute of Technology, Graduate School of Informatics & Environment, Tokyo, Japan Keywords: Ultrafine Particles (UFPs), Laser Printers, Chamber Tests, Secondary Organic Aerosols (SOA), Computer Simulations

#### Aggresive Sampling - Improving The Predictive Value Of Air Sampling For Fungal Aerosols

Morten Reeslev, Jan C. Nielsen, Morten Miller, Lisa Rogers

**Article** Number

Mycometer A/S, Copenhagen, Denmark

Keywords: Fungal aerosols, Beta-N-acetylhexosaminidase, enzyme activity, air sampling

#### Indoor air quality with split air systems in classrooms.

Marcelo L. Pereira, Rogério Vilain, Sandro Conceição, Arlindo Tribess Federal Institute of Education, Science and Technology of Santa Catarina, Department of Refrigeration and Air Conditioning, São José, Brazil

Keywords: Classrooms

# PVC-flooring at home and development of asthma among young children in Sweden, a 10-year

Malin Larsson, Linda Hägerhed-Engman, Syed Moniruzzaman, Laura von Kobyletzki, Fredrik Carlstedt, Jan Sundell, Carl-Gustaf Bornehag

Public Health Sciences. Karlstad, Sweden

Keywords: asthma/allergy, PVC-flooring, cohort study,

### Algorithm For Indoor Sampler Placement With Possible Extension To Indoor-Outdoor **Environments**

Travis Walter, Michael D. Sohn, David M. Lorenzetti

Lawrence Berkeley National Laboratory, Indoor Environment Department, Berkeley CA, United States

Keywords: sampler networks, indoor airflow, optimization,

#### A Baseline Evaluation Of Traditional Cook Stove Smoke Exposures And Indicators Of

#### Cardiovascular And Respiratory Health Among Nicaraguan Women

Maggie L. Clark, Stephen J. Reynolds, Judy M. Heiderscheidt, Bevin R. Luna, Stuart Conway, Annette M. Bachand, John Volckens, Jennifer L. Peel

Colorado State University, Fort Collins CO, United States

Keywords: cardiovascular disease, respiratory disease, indoor air pollution, cook stoves

### PVC Flooring At Home In Early Childhood And Diagnosis Of Autism 10 Years Later

Carolina A. Jernbro, Malin Larsson, Laura Von Kobyletzki, Syed Moniruzzaman, Carl-Gustaf Bornehag

Karlstad university, Karlstad, Sweden

Keywords: DBH study follow-up, polyvinyl chloride flooring, diagnosis of autism, children

#### **Toxicity Of Indoor Fungi In The Presence Of Cigarette Smoke**

Elena Piecková, Marta Hurbánková, Silvia Cerná, Zuzana Kováciková, Máriá Majorosová, Sona Wimmerová

Slovak Medical University, Bratislava, Slovakia

Keywords: Locations Residential, Methods Laboratory studies, Contaminants Biological, Health and Human Perceptions Other respiratory

#### Solving The Polanyi-DR Isotherm In Linear Diffusion Models

David M. Lorenzetti

Lawrence Berkeley National Laboratory, Berkeley CA, United States

Article Number

Keywords: sorption, linear driving force

#### New Urbanism And Air Toxics: A Cause For Pause?

Robert G. Paterson, Elizabeth A. Walsh, Sara Hammerschmidt University of Texas at Austin School of Architecture, Community and Regional Planning, Austin TX, United States

Keywords: Air Toxics, New Urbanism, Urban Design, Mixed Use, Precautionary

#### **Development Of Static Chamber Test Method For Vocs Emissions Of Car Interior Components**

Ik-Hee Lee, Ji-Ho Yoo, Man-Goo Kim

Kangwon National University, department of environmental science, chun-chon, Korea, Republic of

Keywords: measurement, VOC, automobiles,

#### SVOCs in the Indoor Air at a LEED Gold Office Building

Ian C. MacGregor, Bradley P. Goodwin, Marcia G. Nishioka Battelle, Environmental Assessment and Monitoring, Columbus OH, United States Keywords: SVOCs, oxidation products, flame retardants, VOCs

#### A Laboratory Method For Measuring The Ozone Emission From In-duct Air Cleaners

Megan Gunther, Joshua Rhodes, Glenn C. Morrison, Jeffrey Siegel University of Texas at Austin, Austin TX, United States Keywords: Emission rate, HVAC air cleaners, Electrostatic precipitators, Coronas, Standard test method

#### Personal Heating, Is It Comfortable And Can It Save Energy

Linda C. van Oeffelen, Kim van Zundert, Piet Jacobs TNO, Delft, Netherlands Keywords: Personal comfort, Local heating, Offices, Energy saving

#### Numerical Study of Personalised Ventilation Inlets in an Aircraft Suite

Matej Forman, Jan Fišer, Ries Bouwman, Miroslav Jícha Brno University of Technology, Energy Institute, Brno, Czech Republic Keywords: Comfort, Transportation, Models, thermal comfort

### America's Largest Unaddressed Public Health Crisis For Children: Environmental Conditions Of

Schools

Claire L. Barnett

Healthy Schools Network, Albany NY, United States

Keywords: children, asthma, indoor pollution, state policies, schools

# Neighborhood Healthy Homes in Hartford CT- A Community participatory approach to healthy homes assessment

Paula Schenck, Nancy Simcox, Amy McLean Salls University of Connecticut Health Center, Farmington CT, United States

Article Number

Keywords: Healthy homes, community participatory research, asthma and environment,

### Pet Keeping And Its Association With Incidence Of Asthma/allergy Among Swedish Pre-school Children

Syed Moniruzzaman, Malin Larsson, Carl-Gustaf Bornehag

Karlstad University, Karlstad, Sweden

Keywords: asthma and allergy, eczema, indoor environment, pet keeping, rhinitis

#### The Officeair Project: Preliminary Results From A Detailed Chemical Model

Nicola Carslaw, Mike Ashmore

University of York, York, United Kingdom

Keywords: indoor air chemistry, indoor air exposure, OFFICEAIR,

#### Numerical Study Of The Deposition of Spherical and Fibrous Particles in the Human Airways

Matej Forman, Miroslav Jícha, Jakub Elcner

Brno University of Technology, Brno, Czech Republic

Keywords: particles, other respiratory, models,

# The impact of wood heating in houses on airborne endotoxin & sustainable heating in rural forested areas.

J. David Miller, Danny Jiang, Ken L. Ruest, Robert E. Dales

Carleton University, Department of Chemistry, Ottawa ON, Canada

Keywords: wood heating, house characteristics, endotoxin, respiratory health, sustainability

#### The Impact of the Room Occupation and the Indoor Air Parameters on the Aerosol Particle

#### **Concentration in Classrooms**

Bernard Polednik, Marzenna Dudzinska

Lublin University of Technology, Lublin, Poland

Keywords: Indoor environment, Indoor aerosols, Students health, Schools

#### **Performance Criteria For A Personalized Indoor Environment**

Bjarne W. Olesen, Arsen Melikov, Henning Grønbæk

Technical University of Denmark, International Center for Indoor Environment and Energy,

Lyngby, Denmark

Keywords: standards, occupant control, indoor environment, Energy, comfort

### Measurement Of Corrosive And Odorous Gases Emitted From Imported And Domestic

#### Wallboard

Alyson Fortune, Ku-Jih Chen, Hani Cherazaie, Chris Cornett, Madeleine Dangazyan, Wade Henton, Christopher Parnell, Michael Tuday

Columbia Analytical Services, Air Quality Laboratory, Simi Valley CA, United States

Keywords: drywall, Chinese drywall, elemental sulfur, sulfide emission, corrosion

#### **Evaluation Methods For Long Term Indoor Environmental Quality**

Bjarne W. Olesen, Stefano Corgnati, Daniela Raimondo

Article Number

Technical University of Denmark, International Center for Indoor Environmnet and Energy, Lyngby, Denmark

Keywords: indoor environment, criteria, measurements, comfort, air quality

#### **Comparison Of Four Methods Used To Characterize Odorous Compounds**

Michael Tuday, Alyson Fortune

Columbia Analytical Services, Air Quality Laboratory, Simi Valley CA, United States Keywords: odor threshold, amine, carboyxlic acid, volatile fatty acids, reduced sulfur

### Health Risk Assessment Of Human Exposure To Indoor BTEX And Carbonyls Near Petrochemical Industrial Areas

Yu-Ting Su, Chia-Wei Lee, Chung-Hsuang Hung, Chung-Shin Yuan National Kaohsiung First University of Science & Technology, Dept. of Safety, Health and Environmental Engineering, Kaohsiung City, Taiwan Keywords: petrochemical industry, I/O ratio, VOCs, risk assessment, carbonyls

#### After The Smoke Clears: Indoor Chemistry Of Thirdhand Smoke

Mohamad Sleiman, Peyton Jacob, Emma M. Smith, Kevin R. Wilson, Musahid Ahmed, Neal Benowitz, James F. Pankow, Brett C. Singer, Lara A. Gundel, Hugo Destaillats Lawrence Berkeley National Laboratory, Indoor Environment, Berkeley CA, United States Keywords: Tobacco smoke, Indoor environment, Secondary organic aerosol, ozone, Nitrosamines

### **Building Ecology: Linking Microbial Ecology With Indoor Environment And Building Science** Hal Levin

Building Ecology Research Group, Santa Cruz CA, United States

Keywords: Microbial ecology, indoor environment factors, genomics, building ecology, indoor air sciences

#### Effect Of Fossil-fuel Electricity Generators On Indoor Air Quality In Kaduna Nigeria

Andrew Mhya Stanley, Ikemefuna Mbamali, Afolabi A. Dania Ahmadu Bello University, Department of Building, Zaria, Nigeria Keywords: Air Pollutants

# Phylogenetic Analysis Of Bioaerosols Recovered From Commercial Office Environments Reclaimed From Flood Damage

Alina M. Handorean, Kevin M. McCabe, Keeley T. Hernandez, Norman R. Pace, Mark T. Hernandez, Alison Ling

University of Colorado Boulder, Boulder CO, United States

Keywords: DNA sequencing, biodiversity, airborne microbes, remediation

# Computational Simulation Of Indoor Temperature: Comparative Study Between The Application Of High And Low Openings To Improve Ventilation

Patricia R. Drach

Federal University of Rio de Janeiro - UFRJ, Programa de Pós-graduação em Urbanismo, Rio de Janeiro. Brazil

Keywords: Indoor temperature, Wind fields, Opening positions, Computational modelling

Article Number

# **Longitudinal Variation Of Residential Pesticide Use Patterns And Indoor Pesticide Concentrations**

Xiangmei Wu, Deborah H. Bennett, Rebecca Moran, Irva Hertz-Picciotto UC Davis, Public Health Sciences, Davis CA, United States Keywords: indoor air, pesticide use pattern, residential environment,

#### **Second Hand Cigarette Smoke in Cars**

Amanda L. Northcross, Michael Trinh, Jay Kim, S. Katharine Hammond University of California Berkeley, Berkeley CA, United States Keywords: Second Hand Smoke, PAH

### Control of PM2.5 infiltration in high-rise residential buildings: a modeling analysis

Theodore A. Myatt, Taeko Minegishi, Joseph G. Allen, David L. Macintosh Environmental Health and Engineering, Inc., Needham MA, United States Keywords: PM2.5 exposure, ventilation, green building design,

#### Risk Assessment for PCBs in Indoor Air of Schools

David L. MacIntosh, Taeko Minegishi, Joseph A. Allen, Kevin M. Coghlan, Yuri Levin-Schwartz, John F. McCarthy1, James H. Stewart

Environmental Health & Engineering, Inc., also Harvard School of Public Health, Needham MA, United States

Keywords: Polychlorinated biphenyls (PCBs), Risk Assessment, Indoor Air, Schools, EPA methods

# Quantitative Assessment of Inhalation Exposures Generated from Floor Mopping Practices using Fullscale Chamber – A Pilot Study

Wenhao Chen, Justine Weinberg, Kazukiyo Kumagai, Robert Miller, Jennifer Flattery, Debbie Shrem, Jed Waldman

California Dept. of Public Health, Richmond CA, United States

Keywords: floor mopping, cleaning products, airborne exposure, chamber test, repeatability

# Addressing climate change through residential energy upgrades: unique challenges within low-income communities and implications for health

Gary Adamkiewicz, M. Patricia Fabian, Jonathan I. Levy, John D. Spengler

Harvard School of Public Health, Boston MA, United States

Keywords: climate, weatherization, indoor air quality, air exchange, multifamily

#### **PBC Emission Rates And Flux From Legacy Construction Materials**

Taeko Minegishi, Joseph G. Allen, Kevin M. Coghlan, David L. MacIntosh Environmental Health & Engineering, Inc., Needham MA, United States Keywords: Polychlorinated biphenyls (PCBs), Schools, In situ emission rates and flux, Construction

materials

Performance Evaluation Of Mitigation Methods For PCBs In Construction Materials

Article Number

Joseph G. Allen, Taeko Minegishi, John F. McCarthy, Kevin M. Coghlan, James H. Stewart, David L. MacIntosh, Matt A. Fragala

Environmental Health & Engineering, Inc., Needham MA, United States

Keywords: Polychlorinated biphenyls (PCBs), Mitigation methods, Construction materials,

# Dynamical Aspects and Design Implications for Buoyancy Chimney and Wind Scoop Ventilation in a Natural Ventilated Building

Jinchao Yuan, Leon Glicksman

Nexant Inc, Houston TX, United States

Keywords: Ventilation, Natural, Simulation, VOC, Transport

### Improving Exposure Estimates to Outdoor Pm2.5 By Modeling Time-resolved And Species-

specific Aerosol Penetration And Persistence Into Homes

Melissa Lunden, Natasha Hodas, Barbara Turpin, Lisa Baxter, David Rich, Haluk Ozkaynak Lawrence Berkeley National Laboratory, Berkeley CA, United States

Keywords: particles, residential, models, inhalation

#### Formaldehyde Removal By Four Indoor Plant Species

Ahu Aydogan, Lupita D. Montoya

University of Colorado at Boulder, Civil, Environmental and Architectural Engineering, Boulder CO, United States

Keywords: Indoor air quality, interior plants, volatile organic compounds, formaldehyde, growing media

#### **Thermal Interaction of Closely Spaced Persons**

Henrik Brohus, Peter V. Nielsen, Michael Thøgersen

Aalborg University, Aalborg, Denmark

Keywords: Measurements, Human subjects, Ventilation, User/occupant control of indoor

environment, Thermal interaction

### **Building Product VOC Emission Testing And Conformity Assessment Procedures In The U.S.**

Alfred T. Hodgson, Wenhao Chen, Henry Willem, Hal Levin

Berkeley Analytical Associates, LLC, Richmond CA, United States

Keywords: product claim, certification, self-declaration, green building code, low VOC-impact

product

### Qualitative And Quantitative Change Of Indoor Air Microorganism Population By Construction

Roya Mortazavi, Parisa Ariya

McGill, Montreal QC, Canada

Keywords: renovation, bacteria, occupants, worker, respiratory diseases

### **Effects Of Occupational Exposure To Essential Oils On Aromatherapists**

Huey-Jen Su, Ya-Hui Chang, Nai-Yun Hsu, Wei Lin
College of Medicine, National Cheng Kung University, Department

College of Medicine, National Cheng Kung University, Department of Environmental and Occupational Health, Tainan, Taiwan

Article Number

Keywords: aromatherapy, TVOCs, tear film break-up,

#### **Indoor Air Performance Calculations And Values With Obscure Origins**

William Rose, Paul Francisco

University of Illinois at Urbana-Champaign, Building Research Council, Champaign IL, United

States

Keywords: residential buildings, attic ventilation, infiltration, radon, policy

#### Indoor Air Pollution in an Indigenous Highlands Community in Peru

Odessa M. Gomez, Alina M. Handorean, Mark Hernandez, Erica L. Brandt, Amalia A. Lopez, Lupita D. Montoya

University of Colorado at Boulder, Boulder CO, United States

Keywords: Biomass combustion, black carbon, PM2.5, carbohydrates, proteins

# Greater Self-Perceived Severity Of Respiratory Symptoms With Controlled Beta-Pinene Exposure

Huey-Jen Su, Ya-Hui Chang, Nai-Yun Hsu, Pei-Chih Wu, Ching-Chang Lee, Yu-Tung Dai College of Medicine, National Cheng Kung University, Department of Environmental and Occupational Health, Tainan, Taiwan

Keywords: essential oil, beta-pinene, chamber, nasal patency, visual analogue scale

#### Characteristics Of Temporal Variation Of Indoor Particulate Matter At Hospitals In Taiwan

Chien-Cheng Jung, Pei-Chih Wu, Huey-Jen Su

Dept. of Environmental and Occupational Health, College of Medicine, National Cheng Kung University, Tainan, Taiwan

Keywords: indoor air, hospital, particulate matter,

# Environmental Justice And Home Ecology: Learning From The Past, Present And Future Of Community-based Participatory Research In Indoor Environmental Sciences.

Elizabeth A. Walsh

University of Texas, School of Architecture, Austin TX, United States

Keywords: green and healty housing, transdisciplinary research, adaptive co-management, field studies, environmental justice

#### The Impact Of Smoking Bans On Birth Weight--Is Less More?

R. J. BRIGGS

THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK PA, United States

Keywords: Environmental Tobacco Smoke, Policy, Health,

#### Analysis of Natural Ventilation Rate In a Villa Based on Two Measuring Techniques

Chen Huang, Xin Wang, Jianjun Ye, Tianfu Deng, Hu Yu

University of Shanghai for Science and Technology, Shanghai, China

Keywords: National ventilation rate, accessorial airflow passage, tracer gas technique, building,

single room

Article Number

# Assessment of Summer Performance of Ground Source Heating And Cooling System At The SyracuseCoE Headquarters Building

Suresh Santanam

Syracuse CoE, Syracuse NY, United States

Keywords: Ground Source Heating, Energy Performance, Building Energy Management, Green and Sustainable buildings, Summer heating

# Reviewing the methods applied to study the indoor spread of airborne bio-contaminants inside ventilated environments

Sandro T. Conceição, Arlindo Tribess, Marcelo L. Pereira

University of Sao Paulo, Mechanical Engineering, São Paulo, Brazil

Keywords: Indoor air, airborne droplets, cross infection, experimental methods, literature review

#### Use Of A Dusting Cloth For the Mycological Surveillance Of Operating Rooms

Daniela D'Alessandro, Franco Cerquetani, Massimo Fabiani, Nicoletta Vescia

Sapienza University, Civil Building Environmental Engineering, Rome, Italy

Keywords: environmental surveillance, dusting cloths, surfaces, filamentous fungi

### **On The Operating Rooms Ventilation System**

Behrang Sajadi, Goodarz Ahmadi, Mohammad Hassan Saidi

Clarkson University, Potsdam NY, United States

Keywords: Operating room, Ventilation system, Computational fluid dynamics, Surgical site

infection

#### **Harvested Rainwater Quality The Outdoor To Indoor Link**

Kerry A. Kinney, Sarah Frakhreddine, Litta Untung, Carolina Mendez, Tara Gloyna, Michael Barrett, Steven Windhager, Mary Jo Kirisits, Sungwoo Bae

The University of Texas at Austin, Civil, Architectural & Environmental Engineering, Austin TX, United States

Keywords: harvested rainwater, indoor use, disinfection, disinfection byproducts, bioaerosol

# Risks Of Multiple Allergy Diseases And Asthma From Indoor Exposure To Modern Chemicals And Mould Species

Hyunok Choi, Malin Larsson, Syed Moniruzzaman, Carl-Gustaf Bornehag

Harvard School of Public Health, Boston MA, United States

Keywords: home indoor, asthma, allergies, moisture

#### Evaluation of Strategies for Natural Ventilation at the Syracuse Center of Excellence Building

Suresh Santanam, Harish Palanthandalam-Madapusi, Osman Ahmed

Syracuse CoE, Syracuse NY, United States

Keywords: Natural Ventilation, Sustainable buildings, Ventilation control, Building automation

### **Model for Methamphetamine Contaminated Building Materials**

Meng Ke, Glenn C. Morrison, Shi Shu, Richard Corsi

UT Austin, Austin TX, United States

Article Number

Keywords: Equilibrium Partition Coefficient, Mass Transfer Model, Indoor Material

Contamination, Indoor Chemical Emission

#### Surface Reaction Rate Of Ozone And Dihydromyrcenol On Polyvinylchloride And Glass

Shi Shu, Glenn Morrison

Missouri University of Science and Technology, Rolla MO, United States

Keywords: surface reaction, ozone oxidation, kinetics, terpene

#### **Effects of Relative Humidity on Chemical Off-Gassing in Residences**

Miriam Nnadili, Neil Crain, Richard L. Corsi

The University of Texas at Austin, Austin TX, United States

Keywords: residential, field studies, VOCs, relative humidity

#### Comparison of Secondhand Smoke in Bars and Restaurant Non/smoking Sections

David L. Bohac, David T. Grimsrud, Martha L. Hewett, Kristopher I. Kapphahn, Michael G. Apte, Lara A. Gundel

Center for Energy and Environment, Minneapolis MN, United States

Keywords: Secondhand smoke, PM2.5, UVPM, Nonsmoking section, Hospitality venue

#### Clinical Response in Asthma by Improved Housing Design & Construction

Tim K. Takaro, James W. Krieger, Lin Song, Nancy Beaudet, Denise Sharify Faculty of Health Sciences, Simon Fraser University, Burnaby BC, Canada

Keywords: Asthma, Home assessment, Environmental justice, dampness, mold

# Assessing impacts of Indoor Air Quality of green health care facilities and health workers's perceptions

Kok Wee Ng, Victor Wei-chung Chang, Keiko Hirota, Deo Prasad, Goran Runeson

Universtiy of New South Wales, Sydney, Australia

Keywords: Sustainability, Green Hospital Design, Post Occupancy Assessment, Indoor Air Quality

#### Biomonitoring for an indoor air quality and risk assessment

Radoslaw Czernych, Galezowska Grazyna, Wolska Lidia

Medical University of Gdansk, Gdynia, Poland

Keywords: indoor air quality, biomonitoring, risk assessment, Microtox, Ames Test

#### Application of the ecotoxicological assay in the quality of building and furniture materials

Grazyna Galezowska, Radoslaw Czernych, Katarzyna Wilma, Lidia Wolska

Medical University of Gdansk, Gdynia, Poland

Keywords: VOC, building and fitting materials, VOC, IAQ, VOC, IAQ, building and fitting materials

# An Assessment of Risk from Exposure to Second Hand Smoke in Minnesota Bars and Restaurants

Ruiling Liu, David L. Bohac, Lara Gundel, Martha Hewett, Michael Apte, Katharine Hammond University of California, Berkeley, Davis CA, United States

Keywords: Secondhand smoke exposure, Hospitality venues, Risk assessment,

Article Number

# Secondhand Smoke Concentrations in Repeated Visits to a Probability Sample of Bars and Restaurants

Martha J. Hewett, David L. Bohac, Kristopher I. Kapphahn, David T. Grimsrud, Michael G. Apte, Lara A. Gundel

Center for Energy and Environment, Minneapolis MN, United States

Keywords: Secondhand smoke, PM2.5, bar, restaurant, hospitality

#### IMPACT OF SMOKING BAN ON INDOOR AIR QUALITY IN PORTUGUESE RESTAURANTS

Joana Madureira, Ana Sofia Mendes, Paula Neves, João Paulo Teixeira

National Health Institute Dr. Ricardo Jorge, Porto, Portugal

Keywords: smoking Ban, indoor air quality, benzene, respirable particulate matter, restaurants

#### Aircraft Cabin Environment and Passenger Health Symptoms and Discomfort

Hanine Estephan, Eileen McNeely, Ann Louise Sumner, John Spengler

Harvard School of Public Health, Exposure, Epidemiology and Risk Program, Boston MA, United States

Keywords: cabin air quality,, environmental control systems, relative humidity,

#### **Linking Personal Space Preferences to Indoor Air Quality**

Lindsay Graham, Meng Ke, Erin Darling, Richard L. Corsi, Samuel D. Gosling The University of Texas at Austin, Austin TX, United States

Keywords: space preferences, emissions, ambiances, indoor VOC concentrations

#### Recent IAQ regulation in Korea

Yoon Shin Kim, Cheol Min Lee Hanyang University, Seoul, Korea, Republic of

Keywords: IAQ, Korea

### A study on the emission possibility of asbestos into the indoor environment in using asbestoscontained home appliances

Yoon Shin Kim, Wha. Me Park

Hanyang University, Seoul, Korea, Republic of

Keywords: Asbestos, Home appliance, Indoor Environmental Quality,

# A technology-specific methodology for evaluating the GHG mitigation potential of advanced improved cookstoves

Samual Evans, John Field

Colorado State University, Fort Collins CO, United States

Keywords: products of incomplete combustion, global warming potential, cost-benefit analysis, gasifier cookstove, developing countries

#### Stove use monitors (SUMs) as a method to measure fuel use and savings in Bangalore, India

Anoop Muniyappa, Simone Brant, David Pennise

University of California, Berkeley, Berkeley CA, United States

Article Number

Keywords: indoor air pollution, improved cookstoves, kitchen performance test, fuel wood

# The effects of outdoor ozone on indoor chemistry during cooking and non-cooking events in Dhaka, Bangladesh

Shahana Khurshid, Sarah T. Lange

University of Texas at Austin, Austin TX, United States

Keywords: Cook stoves, Deposition Velocity, Homogeneous Chemistry, Construction Materials

#### Social barriers to improved stove adoption in El Fortin, Nicaragua

Lindsay Davis, Maggie Clark, Judy M. Heiderscheidt, John Volckens, Stephen J. Reynolds, Bevin Luna, Kirsten Koehler, Stuart Conway, Annette Bachand, Jennifer Peel Colorado State University, Louisville CO, United States

Keywords: barriers, cookstoves, health, indoor air pollution, surveys

### Stove drive cycle analysis and performance mapping

Jason Prapas, Christian L'Orange, Morgan DeFoort Colorado State University, Fort Collins CO, United States Keywords: drive cycle, field data, mapping, cook stoves, developing countries

#### Impact of an improved stove intervention on exposure and health among Nicaraguan women

Sarah Yoder, Maggie L. Clark, Judy M. Heiderscheidt, John Volckens, Stephen Reynolds, Bevin Luna, Kirsten Koehler, Stuart Conway, Annette Bachand, Jennifer Peel Colorado State University, Fort Collins CO, United States Keywords: cardiovascular disease, cookstoves, indoor air pollution, respiratory disease, stove adoption

#### Influence of vaporization losses on cook stove testing

Christian L'Orange, Morgan DeFoort, Bryan Willson
Colorado State Universty, Fort Collins CO, United States
Kaywords: Biomass, Combustion, Cook Stayes, Test Protocol, Deve

Keywords: Biomass, Combustion, Cook Stoves, Test Protocol, Developing countries

# Situational analysis of household energy and biomass use and associated health burden of indoor air pollution and mitigation efforts in Pakistan

Zafar Fatmi, Asma Rahman, Ambreen Kazi, Masood Kadir, Nalini Sathiakumar Aga Khan University Karachi, Karachi, Pakistan

 $Keywords: developing \ countries, \ biomass, \ energy, \ health \ burden, \ mitigation$ 

# Chronic Prenatal life exposure to carbon monoxide in woodsmoke and children's neurodevelopment in rural Guatemala: A pilot study

Linda Dix-Cooper, Brenda Eskenazi, Carolina Romero, John Balmes, Kirk Smith UC Berkeley, Berkeley CA, United States

Keywords: indoor air pollution, cook stove, child development, prenatal exposure, developing countries

#### Architectural design shapes the built environment microbiome

Article Number

Steve Kembel, G.Z. (Charlie) Brown, Brendan Bohannan, Jessica Green University of Oregon, Center for Ecology and Evolutionary Biology, Eugene OR, United States

Spatial and Temporal Variations of Moisture in Buildings: Factors Which Influence Microbial Growth Rates and the Ecology of the Indoor Environment Lew Harriman

57 South Street, Portmouth NH, United States

#### **Newton Meets Darwin in the Indoor Microbiome**

William W. Nazaroff 661 Davis Hall, Department of Civil & Environmental Engineering, Berkeley CA, United States

#### **Ribosomal RNA Surveys of Human-Occupied Indoor Environments**

Norman R. Pace, Laura Baumgartner, Piret Koll, Kimberly Ross, Steven Mihaylo, Leah Feazel, Mark T. Hernandez, Daniel Frank, Charles Robertson University of Colorado, Boulder CO, United States