

22nd Topical Conference on Gas Utilization 2022

Topical Conference at the 2022 AIChE Spring Meeting and
18th Global Congress on Process Safety

San Antonio, Texas, USA
10 – 14 April 2022

ISBN: 978-1-7138-6818-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2022) by AIChE
All rights reserved.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact AIChE
at the address below.

AIChE
120 Wall Street, FL 23
New York, NY 10005-4020

Phone: (800) 242-4363
Fax: (203) 775-5177

www.aiche.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Unlocking the Decarbonization Potential of Gas-To-Chemicals for the Industry	1
<i>Nikolay Nesterenko</i>	
New Developments in Methane Pyrolysis for Carbon Nanotube and H ₂ Production	4
<i>Stephen Leviness, David Gailus, Deepak Varshney, David Steckler, Alain Bourhis, Zachary Lyles</i>	
Extraction of Chloride Salts from LPG Product Streams Using a Proven Extraction Technology.....	11
<i>Evan Lowry, Grant Jordan, Jonathan Gonzales, Sharon Maydak, Yanxiao Yuan</i>	
Direct Methane Activation by Atomically Thin Platinum Nanolayers on Two-Dimensional Metal Carbides.....	21
<i>Zhe Li, Yang Xiao, Prabudhya Chowdhury, Zhenwei Wu, Tao Ma, Johnny Zhuchen, Gang Wan, Tae-Hoon Kim, Dapeng Jing, Peilei He, Pratik Potdar, Lin Zhou, Zhenhua Zeng, Xiulin Ruan, Jeffrey T. Miller, Jeffrey Greeley, Yue Wu, Arvind Varma</i>	
Oxidative Coupling of Methane Over Supported Mn-Na-W Catalyst: Influence of Preparation Method and SiC Crystal Phase	22
<i>Gontzal Lezczano, Vijay Kumar Velisoju, Shekhar Kulkarni, Pedro Castano</i>	
The Blue and Green Energy Translation.....	24
<i>Johan Malan</i>	
Vapor Cloud Explosions at Nil Wind	25
<i>Filippo Gavelli, Bryant Hendrickson</i>	
VCE Potential Cascade Effects	34
<i>Cynthia Spitzenberger, Mehmet Ozbey, Tatiana Norman, Michael Johnson, Gabriele Ferrara</i>	
Potential Mitigations for LNG Pool Fires	53
<i>Jeffrey Marx, Benjamin Ishii</i>	
Study on Mass Burning Rate of LNG Pool Fire Using a Validated CFD Model.....	64
<i>Zhi Wang, Shuya Hou, Guangjie Li, Edward Liu, Bin Zhang</i>	
Risk Based Approach for Determining Fireproofing Requirements.....	65
<i>Antonino Nicotra, Raminaidu Girada</i>	
Experimental and Theoretical Study on the Bund Overtopping Process After a Catastrophic Failure of LNG Storage Tanks	77
<i>Xiaoyang Luan, Jiali Huo, Shuaiyu Zhao, Edward Liu, Bin Zhang</i>	
Multi-Objective Transportation Route Optimization for Hazardous Materials Based on GIS	78
<i>Yang Wang, Nitin Roy, Bin Zhang</i>	
Transitioning Energy Systems and Shell Technologies	79
<i>Sumit Verma</i>	
Conceptualization, Experimental Proof, and Life Cycle Assessment of Cargen™, a Novel CO ₂ Utilization Technology	80
<i>Mohamed Sufiyan Challiwala, Hanif Choudhury, Debalina Sengupta, Mahmoud El-Halwagi, Nimir Elbashir</i>	

The Impact of Catalyst Synthesis Techniques on the Activity and Stability of Ni/Cu Bimetallic Systems for the Dry Reforming of Methane (DRM) Reaction.....	81
<i>Omar El Hassan, Gasim Ibrahim, Anjaneyulu Chatla, Anuj Prakash, Said Mansour, Nimir Elbashir</i>	
Sustainable Natural Gas Converting Clusters.....	82
<i>Dhabia Al-Mohannadi, Razan Ahmed, Patrick Linke, Mohamed Lameh</i>	
Progress Towards a Comprehensive Model for Mass Transfer and Hydraulics for Structured Packings in Carbon Capture Service	83
<i>Jack Wilfert, Brian Hanley</i>	
Determining the Comparative Value of Carbon Abatement Pathways in Residential Space Heating	89
<i>Alexandra Dill, Tristan Brown, Jenny Frank, HakSoo Ha</i>	
Cost Modeling of Desalination Technologies for the Treatment of Shale Gas Waste Water (SGWW)	90
<i>Selma Atilhan, Gasim Ibrahim, Rohan Shukla, Rahul Ramesh, Debalina Sengupta, Nimir Elbashir, Mahmoud El-Halwagi</i>	
High Efficiency Gas Expansion Based LNG.....	91
<i>Henry Howard</i>	
LNG as Renewable Energy Transport Media	92
<i>Yoshitsugi Kikkawa</i>	

Author Index