

American Institute of Chemical Engineers

Conference of the Computing
and Systems Technology
Division
2007

Held at the 2007 AIChE Spring National Meeting

April 22-27, 2007
Houston, Texas, USA

Printed from e-media with permission by:

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

ISBN: 978-1-60423-363-6

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

ISBN: 978-1-60423-363-6

Copyright (2006) by the American Institute of Chemical Engineers.
All rights reserved.

For permission requests, please contact the American Institute of Chemical Engineers at the address below.

American Institute of Chemical Engineers
Proceedings
Three Park Avenue
New York, NY 10016-5991
Phone: 212-591-8100

www.aiche.org

TABLE OF CONTENTS

Session 11 – Process Design Software and Case Studies

Combined Pre-Concentrator/Recovery Column Design for Ethanol Dehydration Process	1
<i>Saiful Arifin, I-Lung Chien</i>	
Modeling Fuel Desulfurization by Adsorption via a Probability Method	3
<i>Kimberly Drake, John Heinzl, Ian Peek, Donald Hoffman</i>	
Optimum Reactor Design for the Phenol Production	15
<i>Goodarz Khodabakhshi, Mohammad Hussein Sayyar</i>	
Singularities in Reactive Separation Process Problems	23
<i>Lakshmi Sridhar, Gerardo Ruiz</i>	
Optimal Design of Heat-Integrated Separation and Refrigeration Systems	25
<i>Robin Smith, Megan Jobson, Sonia Farrokhpahan</i>	
A Dynamic Model for a Pump Hydraulic System	26
<i>Richard Carranza</i>	

Session 27 – Advances in Optimization for Process Operations, Planning and Scheduling

Global Optimization Based on Modified Generalized Reduced Gradient and Its Application on Interval Analysis	27
<i>Gang (Gary) Xu</i>	
Investigation of Economic Penalty Due to Measurement Bias in Real Time Optimization	28
<i>Peyton C. Richmond</i>	
Synergistic Approach to Real Time Optimization of Modern Industrial Processes	29
<i>Ravi Nath</i>	
Optimization Toolbox for Modeling of Multiple Runaway Reaction Systems	45
<i>V. Sreenivas</i>	
Planning of an Olefins and Aromatics Plant	88
<i>A. Fraga, E. Terra, Arturo Cervantes, Bhieng Tjoa</i>	
Applying Attainable Regions to Scheduling	90
<i>David Glasser, Diane Hildebrandt, Tumising Seodigang, Imtiaz Laher</i>	

Session 57 – Process and Control System Monitoring

Keeping Advanced Process Control (APC) Performance and Maintenance and Improvement of APC System	92
<i>Satoshi Ooyama, Koichi Onodera, Soichi Amano, Minoru Yoneda</i>	
Error Band Identification and Characterization for Advanced Process Control (APC): Performance Assessment	98
<i>Anand Vennavelli, Rob Whiteley</i>	

Process Monitoring and Parameter Estimation via Unscented Kalman Filtering 114
Cheryl C. Y. Qu, Juergen Hahn

Detecting Change in Complex Process Systems with Phase Space Methods..... 126
C. Aldrich, G.T. Jemwa

Thermal Cracking Studies by Design of the Pilot Plant..... 136
Ehsan Bakhshi, Fatemeh Abniki

Session 76 – Process Control and Monitoring Applications

A Novel Mixed Product Run-to-Run Control Algorithm – Dynamic Ancova Approach 137
Ming-Da Ma, Chu-Cheng Chang, David Shan-Hill Wong, Shi-Shang Jang

A Practical Approach to Advanced Process Control of VCM Plants..... 146
Ravi Nath, Mike Yen, Zak Alzein, Eric Wagner

Direct Control of Chemical Processes with Multi-Rate Measurements 164
Sairam Valluri, John Jordan

Model Based Online Analysis and Monitoring of Tank Qualities 165
Suresh S. Agrawal

Development of in-Situ Analysis for the Chemical Industry 166
J.D. Tate, Trevor Knittel

Process Monitoring Using Robust Chemometric Spectrum Models for Predicting Concentration Profiles..... 167
Uwe Kruger, Yan Zhou, David Rooney, Xun Wang, Jillian Thompson

Author Index