

Distillation Symposium 2014

**Topical Conference at the 2014 AIChE Spring Meeting and 10th
Global Congress on Process Safety**

**New Orleans, Louisiana, USA
30 March – 3 April 2014**

ISBN: 978-1-63439-065-1

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© (2014) by AIChE
All rights reserved.

Printed by Curran Associates, Inc. (2014)

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

AIChE
3 Park Avenue
New York, NY 10016-5991

Phone: (203) 702-7660
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: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

(1a) Possible vs. Practical: Engineers Must Lead the Development of Practical Technologies	1
<i>William Banholzer</i>	
(28a) Can Well-Configured Hot Vapor Bypass Condenser Controls Become Unstable?	2
<i>Henry Z. Kister and Daryl Hanson</i>	
(28b) Moving Gamma Scanning Forward – Quantitative Analysis of Tray Capacity	29
<i>Lowell Pless</i>	
(28c) How Sensitive is Your Amine Plant to Operating Conditions?	31
<i>Ralph Weiland, Jesse Santos, Attilio J. Praderio, Nilia Maharaj and Michael Schultes</i>	
(28d) "MEGA Tower" Design Considerations	41
<i>Daniel R. Summers, Mark W. Pilling and Daryl Wiesman</i>	
(28e) Collaborations Between FRI and OSU Chemical Engineering	42
<i>James R. Whiteley, T.J. Cai and Clint P. Aichele</i>	
(28f) “Ecmd™ Trays: A Quarter Century of Excellence”	48
<i>Bob Miller, Kevin J. Richardson and Michael Marsh</i>	
(28g) Bibliography of Mr. Mike Resetarits	49
<i>Tony Cai and Simon Chambers</i>	
(48a) Change Your Board Operator to a Process Manager with State-Based Control	54
<i>Tom Nolan and Dustin Beebe</i>	
(48aa) Huaa – When Learning Is Not Enough	69
<i>Mike Bearrow</i>	
(48ac) Autocad - Smart Grid – Agriculture - Architecture and the United States Government	73
<i>Ethenia Scott</i>	
(48ad) Production, Characterization and Catalytic Studies of Biobased Carbon Materials	74
<i>Qiangyu Yan, Jilei Zhang and Zhiyong Cai</i>	
(48ag) Uncertainty in Sour Gas Viscosities Estimation, What Is the Effect on Your Reservoir Inflow and Tubing Performance	75
<i>Adel Elsharkawy</i>	
(48ah) Chromonic Nanocarriers for Chemotherapeutics: Size Distribution and Control Release Studies	76
<i>Rahul Misra and Sanat Mohanty</i>	
(48ai) Double Containment Piping Solutions for Safety and Environmental Concerns	77
<i>Patrick Fedor and Darin Johnson</i>	
(48b) DTP Process: On-purpose Propylene Production Technology	84
<i>Kazumori Honda, Atsushi Okita, Jumpei Takahashi, Koji Oyama, Nobuyasu Chikamatsu, Mitsuo Morita and Shuji Obayashi</i>	
(48d) Self-Cleaning "Bernoulli" Type Filters Used in Onshore and Offshore Applications	89
<i>Artur W. Krueger</i>	
(48f) Effects of Support on Sulfur Tolerance and Regeneration of Pt Catalysts Measured By Ethylene Hydrogenation and EXAFS	90
<i>Jorge Pazmino, Chuansheng Bai, Jeffrey T. Miller, Fabio H. Ribeiro and W.N. Delgass</i>	
(48h) Improved Operational Efficiency and Reliability through Insulation Materials Selection	91
<i>Steven Coppella</i>	
(48ij) Compliance with EPA Boiler MACT Standards: Mercury-In-Fuel Gas	92
<i>Patrick Laine</i>	
(48k) Young Professional Simulation Tutorial	93
<i>Naomi Hua and Mike Donahue</i>	
(48m) Development Of Polymeric Sulfonic Acid Composite Membranes For Fuel Cell Applications	97
<i>Jimoh Adewole, Abdullah S. Sultan, Amir Al-Ahmed and S. M. Javid Zaidi</i>	
(48o) Facility Siting for Major Projects – Implementation of Consequence Analysis/Quantitative Risk Analysis, a Project Development Lifecycle Framework	105
<i>Mohammad Faruq Haider</i>	
(48p) Global Energy and Transportation and Mobil Oil	118
<i>Ethenia Scott</i>	
(48r) Characterization of Iron Phthalocyanine As the Active Material for Lithium Batteries	119
<i>Sarwan S. Sandhu, Joseph P. Fellner and David Anneken</i>	
(48s) Design of a Free-Fall Reactor for Fast Pyrolysis of Waste Plastics	120
<i>Pravin Kannan and Ahmed AlShoaibi</i>	

(48t) Biosorptive Dehydration of Ethanol/Water Azeotropes Using Compound Starch-Based Adsorbent	121
<i>Wenping Wang, Jinsheng Sun, Xijia Cao and Guangxin Liu</i>	
(48u) Purification of 2-Amino-1-Phenylethanol Enantiomers By a New Technique Combining Distillation and Crystallization	123
<i>Lie-Ding Shiau and Hou-Guo Teng</i>	
(48w) Fabrication of Low Cost Insulating Material from Kaolin Clay for Construction Purposes	124
<i>Naim Faqir, MA Al-Harathi, Hamad AbdulWahhab, Mazen Alshaaer and Reyad Shawabkeh</i>	
(48x) Thermodynamic Study of Binary PAH (Anthracene + Phenanthrene) Solid Mixtures	125
<i>James W. Rice, Jinxia Fu, Emma Sandström and Eric M. Suuberg</i>	
(48y) How Confident Are You That Your Major Accident Risks Are Under Control?	126
<i>Ellis Graeme and Robert Smith</i>	
(48z) Sil Determination: Shortcomings with the Use of LOPA	127
<i>Alan King</i>	
(61a) TRU-SCAN and TRU-CAT Scanning of a Structured Packing Operating at DEEP Vacuum	129
<i>Simon Chambers, Lowell Pless and Ron Carlson</i>	
(61b) Performance Characteristics of an Intermediate Area High Performance Structured Packing	137
<i>Zarko Olujić, Thomas Rietfort, Helmut Jansen and Egon Zich</i>	
(61c) Absorption Hydraulic and Mass-Transfer Characteristics of Raschig Super-Pak 250	138
<i>Lukas Valenz, Frantisek J. Rejl, Jan Haidl and Vaclav Linek</i>	
(61d) Gas-Phase Mass-Transfer Characteristics of Mellapak 250Y Structured Packing Under Distillation Conditions	143
<i>Frantisek J. Rejl</i>	
(61e) Nagaoka Packing "Super H Pack"	150
<i>Tadayoshi Nagaoka</i>	
(61f) Enhancing Multi-Product Fractionator Efficiency Using Properly Designed Vapor and Liquid Distribution Devices	154
<i>SounHo Lee</i>	
(61g) A Submerged Particle Model for Liquid Holdup in Packed Beds	165
<i>Subbarao Duvvuri, Nurhidayah Mohammad, Mohd.Azmi Bustam and Mohamed I. A. Mutalib</i>	
(82a) A New Screening Tool for Designing Energy Efficient Distillation Systems	166
<i>Joshua Huff, Mohit Tawarmalani and Rakesh Agrawal</i>	
(82b) More Operable Dividing Wall Columns	168
<i>Gautham Madenoor Ramapriya and Rakesh Agrawal</i>	
(82c) Dividing Wall Column as Energy Saving Retrofit Technology	169
<i>Igor Dejanovic, Helmut Jansen and Zarko Olujić</i>	
(82d) Process Intensification through Distillation Synthesis, Dividing Wall Columns, and Novel Recycle Methods	170
<i>John Pendergast, Daniel Trauth, Mahesh Sawant and Ravi Dixit</i>	
(82e) Parallelization Opportunities in Distillation Calculations	176
<i>Ronald W Bondy, David Bluck and Srividya Gummadi</i>	
(82f) Batch Distillation Strategy for Higher Purity Products	191
<i>Zbigniew T. Fidkowski</i>	
(119a) Troubleshooting and Rectification of a Giant C3 Splitter Tower Problem Part 1: Troubleshooting	201
<i>Henry Z. Kister, Randy Miller, Brian Clancy-Jundt and Daniel R. Summers</i>	
(119b) Troubleshooting and Rectification of a Giant C3 Splitter Tower Part 2: Rectification	203
<i>Daniel R. Summers, Henry Z. Kister, Brian Clancy-Jundt and Randy Miller</i>	
(119c) A High Capacity Re-Tray That Wasn't - a Practical Lesson in Counter-Intuitive Thinking	205
<i>Sean Hennigan</i>	
(119d) Evaluation and Testing of a Two Phase Feed Distributor	206
<i>Veronica R. Saunders, Eric Clavelle and Andre Bernard</i>	
(119e) Steam Stripping of Aniline Process Wastewater -- a Tutorial, Review, and Critique	223
<i>Robert G. Kunz</i>	
(119f) Kettle Reboiler Hydraulics	251
<i>Mike Resetarits, Tony Cai and Lowell Pless</i>	
(146a) Distillation Fundamentals	253
<i>M.R. Resetarits, A.N. Vennavelli and A. Y. Ogundeji</i>	
(146b) Trays for Distillation and Absorption	267
<i>Tony Cai, Mike Resetarits and A. Y. Ogundeji</i>	
(146c) Structured Packings for Distillation and Absorption	274
<i>Simon Chambers and A.N. Vennavelli</i>	

(146d) Liquid Extraction Processes & Equipment	281
<i>Mike Resetarits, A.Y. Ogundegi and T.J. Cai</i>	
(146e) Acid Gas Absorption Fundamentals	288
<i>Clint P. Aichele, James R. Whiteley, Yash Tamhankar and Mike Resetarits</i>	
(146f) Radioisotope Applications for Obtaining Detailed Process	298
<i>Andy Burleigh and Lowell Pless</i>	
Author Index	