Process Development Division 2023

Held at the 2023 AIChE Spring Meeting and 19th Global Congress on Process Safety

Houston, Texas, USA 12-16 March 2023

ISBN: 978-1-7138-7928-2

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

ADVANCED CARBON REDUCTION TECHNOLOGIES	
118a Decarbonization Roadmap Methodology and Case Study for Petrochemical Facilities	1
118b Hydrodeoxygenation of Bio-Oil Via in-Situ Alkene Dehydrogenation	2
118c Critical Role of Surface Hydroxyl-Amine Interactions in Direct Air Capture Using Single Component and Composite PEI-Silica Sorbents	4
ADVANCES IN PROCESS DESIGN AND DEVELOPMENT	
89a Development and Modeling of Energy-Optimum Aromatic Separation Processes Using Ionic Liquids	5
89b Calorimetry Study of Solution Combustion Synthesis of Ni-Nano Particles in a Closed Environment	13
COST-EFFECTIVE COMMERCIALIZATION OF NEW PROCESSES OR PRODUCTS	
141a A Methodology for Commercial Process Technology Translations of Engineering Thermoplastic Resins	14
141b In Situ Process Monitoring Improves Process Development	15
MODELING TOOLS AND TECHNIQUES FOR PROCESS RANDD I	
55a Solute-Solvent NRTL: A Novel Approach to Model Amino Acid Solubility	16
55b Digital Materials Engineering for Development of Materials	17
POSTER SESSION: PROCESS DEVELOPMENT DIVISION	
42b Modelling and Optimization of Bitumen Partial Upgrading Process Using HYSYS	18

PROCESS SCALE UP AND SAFETY

134a Better Together: Education and Collaboration to Mitigate the Risk of High Energy Materials in Research and Development Laboratories	19
134b Steam Cracker Thermal Imaging and Automated TMT Monitoring Using NIR Camera	20
134c Factors Impacting Level of Carbon Oxides from Use of Anti-coking Catalyst for Steam Cracking of Hydrocarbons (YieldUp*)	21
MODELING TOOLS AND TECHNIQUES FOR PROCESS RANDD II	
72a Properties of Cement Pastes Based on a Comparative Study of Various Rheological Models	22
72b Simulation Study on Gas-Solid Separation Performance of Axial Flow Cyclone	23
72c Thermodynamic Modeling of Adsorption Azeotropes	24
ADVANCES IN PROCESS DESIGN AND DEVELOPMENT II	
105a Role of Calcium Ion in Bio-Organic Fertilizer Production and Diffusion Kinetics into the Soil for Plant Growth	25
105c Multicomponent Aqueous Phase Adsorption Equilibria of Organic Acids on Ion-Exchange Resin	41
Valentino, Meltem Urgun-Demirtas, Chau-Chyun Chen	

Author Index