U. S. PATENTS


PUBLICATIONS


56. “Thermally Coupled Distillation With Reduced Number of Intercolumn Vapor Transfers”, R. Agrawal, AIChE J, 46 (11), 2198 (2000). (A synopsis of this paper was advertised by AIChE J. in November 1999 issue of Chemical Engineering Progress.)


75. “Synthesis of Distillation Configurations: I. Characteristics of a Good Search Space”, A. Giridhar and R. Agrawal, Computers & Chem. Eng, 34, 73 (2010). A certificate identifying this article to be among the most cited articles published in the Journal during the period 2010-2012 was given by the Editor-in-Chief.

76. “Synthesis of Distillation Configurations: II. A Search Formulation for Basic Configurations”, A. Giridhar and R. Agrawal, Computers & Chem. Eng, 34, 84 (2010). A certificate identifying this article to be among the most cited articles published in the Journal during the period 2010-2012 was given by the Editor-in-Chief.


118. “High-pressure fast-pyrolysis, fast-hydropyrolysis and catalytic hydrodeoxygenation of cellulose: Production of liquid fuel from biomass” V.K. Venkatakrishnan, J. C. Degenstein,


29. "Local Thermodynamic Efficiency of Permeation and Membrane Separator Design", J. Xu and R. Agrawal, Paper # 23c, 1995 Annual AIChE Meeting, November 12-17, Miami Beach, FL.

30. "Synthesis of a Distillation Column Configuration for a Multi-component Separation", Paper # 187e, 1995 Annual AIChE Meeting, November 12-17, Miami Beach, FL.


50. “Column Configurations for Ternary Distillation with the Same Number of Reboilers – Condensers”, Z. T. Fidkowski and R. Agrawal, Paper #1f, AIChE Spring Meeting, April 2000, Houston, TX.


“Efficiency comparison of distillation schemes: heat integrated distillation column (HIDiC) and heat pump systems” R. Agrawal, A. Shenvi and D. Michael Herron, AIChE Spring National Meeting, April 2009, Tampa, Fl


97. “Band Alignment Limitations and Light-Soaking Effects in CZTSSe and CZTGeSSe”, C. J. Hages, J. E. Moore, S. Dongaonkar, M. A. Alam, M. S. Lundstrom and R. Agrawal, PVSC 38 Conference June 2012, Austin,TX. (This paper won the best poster paper award)

98. “Influence of Ge Doping on the Defect Distributions of Cu2Zn(Snx Ge1-x)(Sy Se1-y) Fabricated by Nanocrystal Ink Deposition”, J. E. Moore, C. J. Hages, M. S. Lundstrom and R. Agrawal, PVSC 38 Conference June 2012, Austin,TX. (This paper won the best oral presentation by a graduate student).


100. “Reverse Stress Metastability of Shunt Current in CIGS Solar Cells”, S. Dongaonkar, E. Sheets, R. Agrawal, and M. A Alam, PVSC 38 Conference June 2012, Austin,TX. (This paper was nominated for the best poster paper award).


103. “Systematic Synthesis of Augmented Biomass-to-Liquid Fuel Processes” D. Mallapragada, W. N. Delgass, F. H. Ribeiro and R. Agrawal, AIChE Annual Meeting, October, 2012.( This paper was judged as the Best Presentation in the session)


110. “Analysis of Recombination in Cu$_2$ZnSn$_{1-x}$Ge$_x$S$_2$Se$_{4+y}$ thin films by Photoluminescence Spectroscopy”, C. J. Hages, S. Levcenko, T. Unold, and R. Agrawal, MRS Spring Meeting, April, 2013.


INVITED LECTURES


20. “Recent Developments in Multicomponent Distillation Configurations”, Purdue University, April 2003.


38. “Synthesis of Multicomponent Distillation Column Configurations”, Department of Chemical Engineering, Clarkson University, Potsdam, NY, 2005.


44. “Energy Supply Challenges and Opportunities”, Peking University, Beijing, China, May 2006.

45. “Energy Supply Challenges and Opportunities”, Department of Chemical Engineering, Tsinghua University, Beijing, China, May, 2006.


86. “Sustainable Energy Utilization and Transformation”, George W. Woodruff School of Mechanical Engineering’s Sustainable Energy Pathways and Solutions Workshop, Georgia Tech., Atlanta, April 2009.


89. “Synergistic Processes for Biofuels”, Plenary Lunch Lecture, BioFuels Conference- The Next Generation of Biofuels, Mississippi State University, Jackson, Ms, August 2009.


102. “Energy Saving Opportunities in Multicomponent Distillation: Optimum Configuration and Thermal Coupling between Distillation Columns”, EPFL, Lausanne, Switzerland. Sept 2010

103. “Chemical Engineering in a Solar Energy Driven Sustainable Future”, PPG Foundation Keynote Address, 32nd Annual Chemical Engineering Graduate Student Association Symposium, Carnegie Mellon University, Pittsburgh, PA, October, 2010

104. “Solar Based Sustainable Energy Solutions”, Pirkey Lecture, University of Texas, Austin, Tx, Nov. 2010


106. “Energy Savings in Distillation via Identification of Useful Configurations”, Invited talk in the Gerhold Award Plenary Session on Separations, AIChE Annual Meeting, Salt Lake City, UT, Nov. 2010


108. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Semiconductors”, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin Nov. 2010


110. “Synthesis of Multicomponent Distillation Configurations and Solar Cells from Nanocrystal Inks of Quaternary Semiconductors”, IIT Kanpur, India, March 2011

111. “Chemical Engineering in a Solar Energy Driven Sustainable Future”, IIT Kanpur, March 2011

112. “Chemical Engineering in a Solar Energy Driven Sustainable Future”, Hugh M. Hulburt Memorial Lecture, Northwestern University, Evanston, IL, April, 2011

113. “Thin Film Solar Cells From Nanocrystal Inks of Quaternary Semiconductors”, Institute of Energy Conversion, University of Delaware, Newark, DE, May 2011
114. “Thin Film Solar Cells From Nanocrystal Inks of Quaternary Semiconductors”, DuPont Experimental Station, Wilmington, DE, May 2011


116. “Chemical Engineering in a Solar Energy Driven Sustainable Future”, Hess Lecture, Department of Chemical Engineering, University of Virginia, October 2011

117. “Novel Pathways for Biomass-to-Liquid Fuel Production”, In session honoring Professor Santosh K. Gupta, AIChE annual meeting, Minneapolis, October 2011.


120. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Semiconductors”, Keynote Lecture, 6th Sino/US joint conference, Beijing, China, Nov. 2011


123. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Semiconductors”, National University of Singapore, Singapore, December 2011


126. “Chemical Engineering in a Solar Driven Sustainable Future”, Ken Nobe Founders Lecture in Chemical and Biomolecular Engineering, UCLA, February 2012


128. “Chemical Engineering in a Solar Driven Sustainable Future”, Truth and Beauty Seminar Series, School of Chemical Engineering, Purdue University, March 2012

130. “How Feasible is Renewable Energy”, Callout Night Speaker, PugWash, Purdue University, August, 2012

131. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Chalcogenides”, AVS Materials for Energy Meeting, University of Illinois at Urbana-Champaign, September, 2012

132. “Chemical Engineering in a Solar Energy Driven Sustainable Future”, Department of Chemical Engineering, University of Pennsylvania, Sept., 2012

133. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Chalcogenides”, Brookhaven National Lab, September, 2012

134. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Chalcogenides”, Chemistry Department, University of Chicago, October 2012

135. “Thin Film Solar Cells from Nanocrystals of Quaternary Semiconductors”, Joint symposium of Korean Institute of Chemical Engineering (KIChe) and AIChE to celebrate 50th anniversary of KIChe, AIChE Annual Meeting, Pittsburgh, October 2012.


137. “Nanocrystal Ink based route for Cu(In,Ga)Se\textsubscript{2} and Cu\textsubscript{2}ZnSnS\textsubscript{4} Based Efficient Solar Cells”, National University of Singapore, Singapore, December 2012.


143. “Thin Film Solar Cells from Nanoparticle Inks of Quaternary Chalcogenides”, Inaugural lecture in the Photovoltaic Lecture series of the Birck Nanotechnology Center, Purdue University, January 2013.


146. “Thin Film Solar Cells from Nanocrystal Inks of Quaternary Chalcogenides”, Keynote Lecture, Colombia-US Workshop on Nanotechnology in Energy and Medical Applications, Medellin, Colombia, March 2013.


149. “Solar Economy - Is it Feasible?”, Plenary Lecture, Purdue-Mexico Workshop on Sustainability, Purdue University, April, 2013.


151. “A Sustainable Future”, Energy Academy, Purdue University, June 2013.

152. “A Sustainable Future”, SURF Seminar Series, Purdue University, July 2013.


155. “Chemical Engineering for a Sustainable Energy Future”, Chemical Engineering, University of Michigan, Ann Arbor, September 2013.


160. “Nanoparticle Ink based route for Efficient Thin Film Solar Cells”, The 3rd Annual KAIST CBE Global Distinguished Lecture, Department of Chemical and Biomolecular Engineering, KAIST, Daejeon, Korea, Nov. 2013.


163. “Engineering a Sustainable Energy Future”, School of Chemical Engineering, Purdue University, West Lafayette, IN, Nov. 2013.


165. “Solar Energy- A key to a Sustainable Energy Future”, Purdue President’s Westwood Colloquia, West Lafayette, IN, Feb. 2014.


169. “Nanoparticle Ink Based Route for Thin Film Solar Cells of Quaternary Chalcogenides”, Center for Solar and Photovoltaic Engineering Research (SPERC) Workshop, King Abdullah University of Science and Technology (KAUST), Saudi Arabia, April, 2014.


172. “Welcome to SURF 2014”, Lecture to Incoming SURF students at Purdue University, West Lafayette, IN, May 2014.


175. “Energy Efficiency in Distillation”, NRC Board on Chemical Science and Technology (BCST), Irvine, CA, August 2104.

176. “Nanoparticle Ink Based Route for Thin Film Solar Cells of Quaternary Chalcogenides”, 19th International Conference on Ternary and Multinary Compounds, Nigata, Japan, September 2014.
177. “Engineering a Sustainable Energy Future”, Agriculture and Biological Engineering, Purdue University, West Lafayette, IN, 2014

178. “Engineering A Sustainable Energy Future”, Distinguished Lindsay Lecturer, Chemical Engineering, Texas A & M University, College Station, TX, September, 2014


180. “Engineering A Sustainable Energy Future”, Chemical Engineering, University of South Florida, Tampa, FL, October, 2014

