Patent Search

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Inventor

Name	Address	Country
Dr.Kotte Shylaja, Assistant Professor in Chemistry / Department of H&S, St. Peter's Engineering College.	St. Peter's Engineering College, Dullapally, Maisammaguda, Medchal, Secunderbad, Hyderabad, Telangana-500100	India
Prasad Pinnoju, Assistant Professor / Department of Chemistry, Vaagdevi College of Engineering.	Vaagdevi College of Engineering, Bollikunta, Warangal, Telangana-506005.	India
Dr.Surinderpal Singh, Professor of Chemistry / Department of H&S, CMR Engineering College UGC Autonomous.	CMR Engineering College UGC Autonomous, Medchal, Hyderabad, Telangana-501401.	India
K.Manjula, Assistant Professor of Chemistry / Department of H&S, Keshav Memorial College of Engineering.	Keshav Memorial College of Engineering, Ibrahimpatnam, R.R. District, Hyderabad, Telangana-501510.	India
Dr.G.Sujatha, Professor in Chemistry / Department of Freshman Engineering, Audisankara College of Engineering & Technology (Autonomous).	Audisankara College of Engineering & Technology (Autonomous), Gudur, Andhra Pradesh-524101.	India
Raju Bura, Assistant Professor / Department of Chemistry, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal, Hyderabad, Telangana-500043.	India
Dr.Srinu.Bhoomandla, Assistant Professor in Chemistry / Department of Freshman Engineering, Geethanjali College of Engineering and Technology.	Geethanjali College of Engineering and Technology, Cheeryal, Keesara, Medchal, Telangana-501301.	India
R Govardhan, Assistant Professor in Chemistry / Department of H&S, Kasireddy Narayan Reddy College of Engineering & Research (KNRR)	Kasireddy Narayan Reddy College of Engineering & Resea rch (KNRR), Abdullapurmet, Hayathnagar, Rangareddy, Telangana-501505.	India

Applicant

Name	Address	Country
Dr.Kotte Shylaja, Assistant Professor in Chemistry / Department of H&S, St. Peter's Engineering College.	St. Peter's Engineering College, Dullapally, Maisammaguda, Medchal, Secunderbad, Hyderabad, Telangana-500100	India
Prasad Pinnoju, Assistant Professor / Department of Chemistry, Vaagdevi College of Engineering.	Vaagdevi College of Engineering, Bollikunta, Warangal, Telangana-506005.	India
Dr.Surinderpal Singh, Professor of Chemistry / Department of H&S, CMR Engineering College UGC Autonomous.	CMR Engineering College UGC Autonomous, Medchal, Hyderabad, Telangana-501401.	India
K.Manjula, Assistant Professor of Chemistry / Department of H&S, Keshav Memorial College of Engineering.	Keshav Memorial College of Engineering, Ibrahimpatnam, R.R. District, Hyderabad, Telangana-501510.	India
Dr.G.Sujatha, Professor in Chemistry / Department of Freshman Engineering, Audisankara College of Engineering & Technology (Autonomous).	Audisankara College of Engineering & Technology (Autonomous), Gudur, Andhra Pradesh-524101.	India
Raju Bura, Assistant Professor / Department of Chemistry, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal, Hyderabad, Telangana-500043.	India
Dr.Srinu.Bhoomandla, Assistant Professor in Chemistry / Department of Freshman Engineering, Geethanjali College of Engineering and Technology.	Geethanjali College of Engineering and Technology, Cheeryal, Keesara, Medchal, Telangana-501301.	India
R Govardhan, Assistant Professor in Chemistry / Department of H&S, Kasireddy Narayan Reddy College of Engineering & Research (KNRR)	Kasireddy Narayan Reddy College of Engineering & Resea rch (KNRR), Abdullapurmet, Hayathnagar, Rangareddy, Telangana-501505.	India

Abstract:

Abstract Ionic liquids, or ILs, are a category of liquids with specific characteristics that set them apart from other liquids. These characteristics include low volatility, su thermal stability, and significant electrical conductivity. These features make them desirable for use in various industrial contexts, including energy storage, catalysis, separation. The density and other thermos-physical features of ILs are crucial for their help in multiple contexts. IL binary mixed density modelling and data analysis in this work. We present two models, one with four inputs and the other with three, to estimate the density of these mixes. They point out that the mole fraction of H deduced from the IL mole fraction; hence it is not an independent variable. To forecast the density of a binary mix (methanol + [BMIM][BF4]) with water or alcohol. A models are proposed. The first one forecasts the density of a binary mixture of ionic liquids at atmospheric pressure, whereas the second anticipates its density acros pressures. The data points used to create the models.

Complete Specification

Description:Data-Driven Systems for Estimating Ionic Liquids
Density in Binary Mixtures

Field and Background of the Invention
Ionic liquids have fascinated increasing thoughtfulness in recent years owing to their unique features and wide range of applications. However, to fully utilize their properties and optimize their application performance, precise knowledge of their thermos-physical properties, such as density, is essential. Traditional experiment methods for measuring ionic liquid density are often cumbersome and time-consuming. Therefore, data-driven systems have been developed to provide accurate a efficient estimations of ionic liquid density in binary mixtures. One such approach is machine learning, which has gained popularity in recent years for quantitative predictions of ionic fluid properties. In addition to density, critical properties of ILs, such as critical temperature and pressure, are essential for understanding their behaviour. Various methods exist to estimate binding properties, including the group contribution technique. Valderamma and Robles utilized this method to approximation the acute properties of ionic liquids using 26 groups, demonstrating worthy consistency in defining the density of ILs.
The group contribution method can also be combined with artificial neural networks to assess the density of imidazolium- centred ILs at various temperatures and pressures. Additionally, this method be able to be used to assess the densities of various types of ILs at various temperatures. It is worth noting, however, that while ANN-based methods usually provide better estimation results than traditional approaches, they are not as convenient to use in predictive modelling. It is necessary expand the measurements to multiple isotherms to overcome the limitations of traditional experimental methods and increase accuracy. By combining this approa

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