Liquid Liquid Systems

Developing ways to enhance the mixing of two liquids is an industrially important topic because of limitations on mass transfer especially imposed by immiscibility. Applications of immiscible liquids in commercial settings generally include that of liquid-liquid extraction, formation of emulsions and use in reaction systems. A Taylor-Couette system could help resolve mixing problems and enhance mass transfer by maximizing the interfacial area between the immiscible liquids. This work looks at liquid-liquid Taylor-Couette flows, the development of its instability and use as an emulsifier to create silica microcapsules from microemulsions. The first objective was to characterize the development in the dynamics of the flow in the system and understanding how the flow develops with changes in the operating parameters is important to know how to design an efficient reactor. The primary flow transitions are studied for several model systems, with varying physical parameters of the liquid, in an effort to quantify these transitions. How the addition of surfactants to depress the interfacial energy affected the system was also studied. We also looked at how converting the process into a continuous process by inducing axial flow affects these instabilities for different Reynolds Numbers. Finally, an attempt is made to predict primary flow transitions for a given pair of liquids based on the interfacial energy of the two liquids. Secondly, we looked to apply these concepts to a reaction system. Silica microcapsules are an efficient way of storing sensitive materials due to their high mechanical strength and their resistance to chemical treatment. Current methods for preparing these capsules require high-energy inputs due to the use of sonicators for emulsification as well as the inability to formulate a continuous process using such methods. Using the Taylor-Couette reactor as an emulsifier to generate microcapsules is studied. The sizes of the particles are characterized by two length scales that reflect the

dispersed phase length scales expected in the system.
Natural Convection Mass Transfer in Solid-liquid and Liquid-liquid Systems
Gas-liquid vapour-liquid and liquid-liquid systems
Studies in Phase Version and Ambivalance in Liquid-liquid Systems
Boundary Influence on Drop Motion in Liquid-liquid Systems
Liquid-liquid Systems in a Continuous Taylor-Couette Reactor
Prediction of Drop Volumes in Liquid-Liquid Systems
A Study of Mass Transfer Into Droplets in Liquid-liquid Systems Using a New Optical Technique
Phase Inversion in Stirred Liquid Liquid Systems
A Study of the Formation and Behaviour of Drops in a Liquid Environment

Vapor-liquid equilibrium data, heat of mixing (excess enthalpies), and volumetric properties of systems are required for both the applications in design of industrial technological processes and the understanding the structure and the intermolecular interactions in the systems. On the basis of classical thermodynamics the measured experimental data combined together enable us the calculation of non-measurable thermodynamic properties significant for the technological calculations. The present volume is a compilation of experimental and derived property data on subcritical binary homogeneous (single-phase) or heterogeneous (two-phase) liquid–liquid mixtures. All the components are well-defined pure substances, which are organic nonelectrolytes and water. The present volume is divided into three subvolumes (A, B, C). 800 representative data sets that cover all types of properties and chemical systems are selected for Subvolume A. While Subvolume B comprises 1032 data sets for binary mixtures containing one or two hydrocarbons, Subvolume C is providing 1014 data sets for non-hydrocarbon binary mixtures.

Phase Inversion and Droplet Size Measurements in Agitated Liquid-liquid Systems

Heat of Mixing, Vapor-Liquid Equilibrium, and Volumetric Properties of Mixtures and Solutions

Initiation of Interfacial Turbulence in Liquid-liquid Systems

Studies in Axial Mixing in Liquid-liquid Systems

Interfacial stability in binary liquid-liquid systems

The use of a liquid scintillator. II

The Effects of Agitator Geometry in the Mixing of Liquid-liquid Systems

Coalescence Devices for Liquid-liquid Systems
Separation techniques
Liquid-Liquid Systems
Interfacial Area Measurement in Liquid-liquid Systems by Radioisotopes
Understanding Transitions and Use in Applications
Modeling and Simulation of Drop Size Distributions in Stirred Liquid Liquid Systems
Electrowetting of Ionic Liquids in Solid/liquid/liquid Systems
Studies in Mass Transfer for Liquid-liquid Systems
Fundamentals of Binary Droplet Coalescence in Liquid-Liquid Systems
Mechanisms of Drop Breakage in Dilute, Agitated Liquid-liquid Systems
The Characterisation of Two-phase Liquid-liquid Systems Using Holography
Separation Techniques 1 - Liquid-Liquid Systems

Explore and review novel techniques for intensifying transport and reaction in liquid-liquid and related systems with this essential toolkit. Topics include discussion of the principles of process intensification, the nexus between process intensification and sustainable engineering, and the fundamentals of liquid-liquid contacting, from an expert with over fortyfive years' experience in the field. Providing promising directions for investment and for new research in process intensification, in addition to a unique review of the fundamentals of the topic, this book is the perfect guide for senior undergraduate students, graduate students, developers, and research staff in chemical engineering and biochemical engineering.

Binary Liquid Systems of Nonelectrolytes II
Droplet Coalescence and Breakdown Studies in Liquid-liquid Systems
Intensification of Liquid–Liquid Processes
Mass Transfer and Chemical Reaction in Gas-liquid-liquid Systems
Modelling of Phase Inversion and Assciated Phenomena in Liquid-liquid Systems
The Motion of Drops in Liquid-liquid Systems (with and Without Mass Transfer)
Fundamentals of mass transfer
Drop Formation in Liquid-liquid Systems
Separation Techniques: Liquid-liquid systems

In this thesis, the static and dynamic electrowetting behaviour of pure and diluted ionic liquids in contact with an ambient phase of hexadecane was studied.

Interfacial Tension in Liquid-liquid Systems
Properties of Liquid-liquid Systems
Liquid-liquid Systems
Interfacial Mass Transfer in Liquid-liquid Systems
Liquid-liquid Systems Online (LLS Online)
Jet Break-up in Liquid-liquid Systems

A Study of Electrically Charged Drops in Liquid-liquid Systems
Experimental Investigation of Mass Transfer to Droplets in Liquid-liquid Systems
Studies of Phase Inversion and Ambivalence in Liquid-liquid Systems