

Die Vorträge finden jeweils um 16.15 Uhr im Hörsaal H3, Egerlandstr. 3 statt.  
Alle Interessenten sind herzlich eingeladen.

## 13. Januar 2011

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## Thermophysical Properties and Applications of Ionic Liquids in Chemical Engineering

The thermophysical properties of ionic liquids and supercritical CO<sub>2</sub> are very different. Ionic liquids are non-volatile but highly polar compounds, whereas CO<sub>2</sub> is a non-polar but highly volatile compound. The combination of these two types of solvents has some unique features. It has been discovered that the solubility of supercritical CO<sub>2</sub> in certain ionic liquids is very high, but that, on the other hand, CO<sub>2</sub> is not able to dissolve these ionic liquids. Therefore, it was found to be possible to extract a solute from an ionic liquid using supercritical CO<sub>2</sub> without any contamination by the ionic liquid. The phase behaviour of many binary and ternary ionic liquid + supercritical CO<sub>2</sub> systems was subsequently studied, and some of peculiar observations will be addressed. Furthermore, it will be shown that if CO<sub>2</sub> is replaced by a polar molecule like CHF<sub>3</sub>, the phase behaviour with ionic liquids will be completely different and even large concentrations of the ionic liquid can be present in the vapour phase.

Combined with the fact that ionic liquids are excellent reaction media for catalyzed reactions, this led to the development of chemical processes, where the reaction was carried out in the ionic liquid and the product was extracted afterwards with supercritical CO<sub>2</sub>. Newest developments include the multi-functional use of supercritical CO<sub>2</sub> as extraction medium, transport medium and as miscibility controller in these processes, resulting in higher reaction and separation rates.

Furthermore, it will be discussed how ionic liquids can be used in all kind of separation processes by making use of their unique thermophysical properties.