RUHR-UNIVERSITÄT BOCHUM

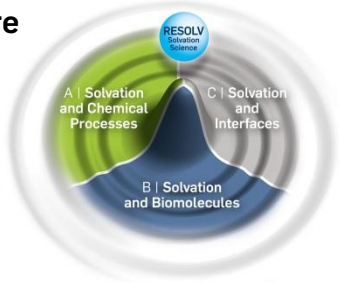
SOLVATION SCIENCE @ RUB

RUB

Einladung zur **ersten Vortragsveranstaltung im Rahmen des RESOLV Kolloquiums**

Mittwoch, den **14.11.2012** um **15:00 Uhr (s.t.)** in **ND 5/99**

15:00 Uhr **Supercritical Fluid Technology - Key to the Future**
Prof. Youn-Woo Lee
School of Chemical & Biological Engineering,
Seoul National University, Korea



15:45 Uhr Diskussion

Abstract:
Supercritical fluid technology is one of the most promising green chemistry-based future technologies that have the advantages of both the environmentally-benign tool which can develop new, better, and clean processes and technology which can produce new, better, and green products. In this presentation, recent research and development activities of supercritical fluid technology are briefly discussed with emphasis on the commercialization efforts. Recent research and development activities of supercritical fluid processing of food are briefly discussed. Discussion includes the large-scale supercritical Fluid Extraction (SFE) processes of sesame oil and defatted sesame powder, defatted brown rice, defatted rice bran, and Korean red ginseng. Some results for formation of submicron-size particles including ibuprofen, aspirin and RDX by RESS process, in which supercritical CO2 or compressed dimetylether (DME) is used as a solvent, will be discussed. Cefpodoxime proxetil (CPD), and valsartan, proteins like insulin, BSA, and trypsin, microencapsulation of drug(Lycopene/β-cyclodextrin Inclusion Complex), cyclotetramethylenetetranitramine (HMX), and stereo-complex of biodegradable polymers (s-PLA) by SAS process will be presented. In the fields of SWS and SCWO, trend of nano particles of various metal oxides prepared in supercritical water or alcohol and a continuous production (1,000 ton/yr) of LiFePO4, a cathode material for Li ion battery, by Hanwha Chemical will be introduced. We propose a novel technology in which in-situ formed nano-particles during SWS can act as heterogeneous catalysts for enhancing oxidation while the exothermic heat of SCWO can provide enough energy to SWS process. Wastewaters from Cu-plating process and acrylonitrile manufacturing plant were treated by SCWO not only to decompose hazardous organic compounds effectively but also to recover valuable inorganic materials. It will be discussed that a commercial SCWO plant for treating wastewater from TPA manufacturing process which contains many organic acids and cobalt and manganese acetate. During the operation of the integrated process, the metal oxide precursor can be fed into the SCWO reactor to produce nano-particles of various metal oxides. Finally, biorefinery using supercritical fluids which produce multiple chemical intermediates and polymers from lignocellulose based biomass will be discussed.

Cluster of Excellence RESOLV: www.ruhr-uni-bochum.de/solvation