ORGANISATION

Date

Begin: Wednesday, 30rd Aug. 2017, 9:00 am
Building 44, room 44-380

End: Friday, 1st Sept. 2017, 12:00 pm

Venue

TU Kaiserslautern
Lehrstuhl für Thermische Verfahrenstechnik

Building 44, Room 44-380
Building 64, Pilot Hall

Postfach 3049
67653 Kaiserslautern, Germany
www.mv.uni-kl.de/tvt

Routes and site map:

https://www.mv.uni-kl.de/en/tvt/tvtkontakt

Participation fee & accommodation

Costs include lunches, beverages, dinners, software and course materials. GVT/VDI and DECHEMA members are eligible for reduced early bird registration. The number of participants is limited. Participation fees are:

Student 850,- € (early bird 600,-€)

Industry 1.500,- € (early bird 1.300,-€)

Accommodation is not included in the participation fee see http://www.trivago.de

REGISTRATION

Please register for the course no later than 31st July 2017 (early bird May 15th) and note if a special meal (vegetarian, food allergy) is required:

Forschungs-Gesellschaft Verfahrens-Technik e.V. (GVT)

www.gvt.org/SeparationProcesses

Mrs. Anna Maria Hipp
Theodor-Heuss-Allee 25
60486 Frankfurt/Main

Phone: +49 69/7564-118
Fax: +49 69/7564-437

EMail: gvt-hochschulkurse@gvt.org
Internet: www.gvt.org

For more information (detailed programme) concerning the organisation, please contact:

Mrs. Hipp, GVT
Phone, Fax and mail see above.

For technical questions contact
Mrs. Angelika Weis, TU Kaiserslautern
E-Mail: tvtsek@mv.uni-kl.de
Phone: +49 631/2052117
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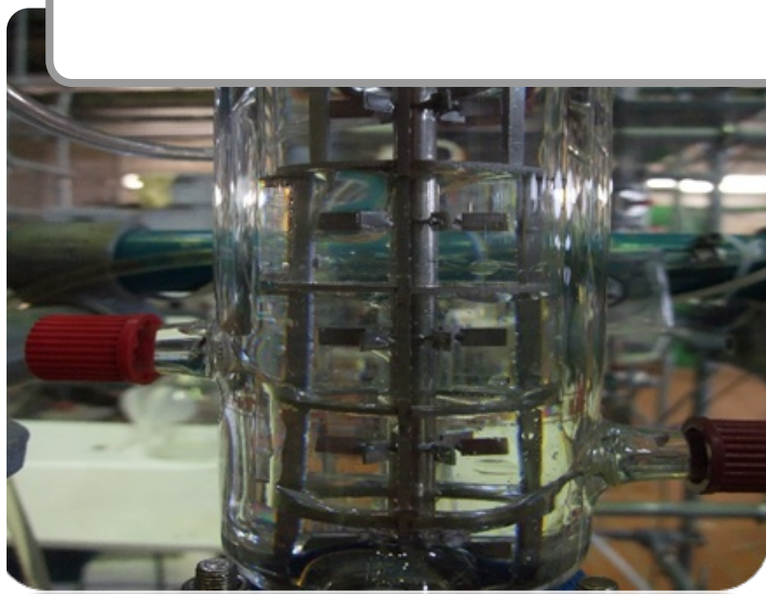
Liquid Extraction

Practice & Theory

Kaiserslautern, 30rd August-1st September 2017

www.gvt.org/SeparationProcesses



Scientific Organisation

Prof. Dipl.-Ing. Dr. techn. Hans-Jörg Bart
TU Kaiserslautern
Chair of Separation Science and Technology
Kaiserslautern, Germany

Organisation

Forschungs-Gesellschaft Verfahrens-Technik e.V. (GVT), Frankfurt/Main

LIQUID EXTRACTION

Liquid extraction is a unit operation to recover or separate substances with a close boiling point, which are temperature sensitive or ionic species. The later can be recovered via complex formation in reactive extraction. 25 % of the primary copper production is based on this technology. A wide potential is with API, nutraceutical or intermediates production in the chemical, pharmaceutical or food industries.

The purpose of this summer school, which is aimed at PhD students or young professionals, is to exemplify key extraction techniques (column design, phase separation) and obtain a fundamental understanding of economically effective process steps.

The course starts with fundamentals and experimental studies concerning the topics liquid-liquid extraction, apparatus simulation and design and two phase flow hydrodynamics. Computer exercises will be performed using CHEMSEP© and PPBLab software. For practical sessions, the participants will be divided into groups. Each group will perform the lab experiments in a pilot hall and in parallel sessions computer exercises. Each participant will be responsible for an individual task (setup, calibrating, analysing, control, etc.) during the experiment. The results will be discussed at the end of each session.

On the last, day an introduction to reactive extraction principles and related techniques (aqueous two-phase extraction, vegetable extraction, etc.) will be given. Finally, a numerical study of a liquid-liquid extraction column will introduce the students to efficient extraction column design accounting for changes in droplet size along the column height (PPPBLAB software).

COURSE PROGRAMME

Course Outline

The $2^{1/2}$ day course combines traditional lectures with computer exercises and pilot scale lab experiments. A comprehensive and intensive course programme with included course materials will provide practical information and guidance in this field.

Lectures

- ► Principles of extraction processes
- ► Extraction hydrodynamics
- ► Reactive extraction and related techniques
- ► Thermodynamics of extraction
- ► Intro to PPBLab software for column design

Lab experiments and computer exercises

- ► Lab experiments - extraction column
- ► Lab experiments - extraction phase separation
- ► Computer exercise - extraction

LECTURERS

Prof. DI Dr. Hans-Jörg Bart,
studied Chemical Engineering at the TU Graz, Austria, and received his PhD in 1982 in the field of metal salt extraction. Since 1994 he is full professor at the Chair Separation Science and Technology of the TU Kaiserslautern. He is head of the ProcessNet working party Extraction and chairs the International Committee of Solvent Extraction.

Dr.-Ing. Mark Hlawitschka,
studied Mechanical and Process Engineering at TU Kaiserslautern and received his PhD in the field of liquid-liquid extraction. Since 2013 he is Post-Doc at the Chair of Separation Science and Technology at TU Kaiserslautern.

Prof. Dr. Thomas Zemb,
is founding Director of the Institut de Chimie Séparative de Marcoule (UMR 5257 CEA/CNRS/UM2/ENSCM) since March 2007 and since 1994 full professor at the Institut des Sciences et Techniques Nucléaires.

Prof. Dr.-Ing. Menwer Attarakih,
studied Chemical Engineering at the University of Jordan and received his PhD in Kaiserslautern in the field of population balances. He is full professor at the University of Jordan.