TECHNISCHE UNIVERSITÄT
BERGAKADEMIE FREIBERG
The University of Resources. Since 1765.

Institute of
Energy Process Engineering and
Chemical Engineering

Reiche Zeche • 09596 Freiberg • Phone +49 3731 39-4511 • Fax +49 3731 39-4555 • Email evt@iec.tu-freiberg.de

Compact Course:

FUNDAMENTALS OF GASIFICATION PROCESSES

20th - 22nd April 2015

Course description:

The compact course “Fundamentals of gasification processes” is designed to provide a general overview of gasification technologies and related issues. Within three days a broad survey on the fundamentals of gasification along the entire process chain will be given. Starting with some theoretical basics on gasification and relevant feedstocks, the following part includes a general overview on gasification processes. The second day is starting with biomass gasification technologies followed by flow sheet simulation and CFD modelling aspects. In the evening lecture, an overview over Underground Coal Gasification will be presented. Issues like gas purification and ash and slag behaviour are addressed on the third day. Several technical tours complete the course program.

Target group:

The course is intended for engineering and technical personnel who either want to get a first understanding of gasification or plan to update and expand their knowledge on gasification processes and technologies.

Training location:

Institute of Energy Process Engineering and Chemical Engineering

Fuchsmuehlenweg 9, Haus 1, 09596 Freiberg

Accommodation:

A number of single rooms (86 EUR per room per day incl. breakfast) are reserved at

Hotel Alekto

Am Bahnhof 3, 09599 Freiberg

+49 (0) 3731 7940; info@alekto.de

Please book a room by yourself referring to the keyword “Gasification Course” until 19th March 2015.

Shuttle Service:

A daily shuttle service from Hotel Alekto to the training location and back will be arranged.

Registration fee:

2.250 €

Including all sessions, course documents, lunch and evening event

Excluding VAT on catering and social program fee

Registration:

Via email: Sindy Bauersfeld (Sindy.Bauersfeld@iec.tu-freiberg.de)

Cancellation policy:

Cancellations have to be sent to the IEC in text format. If you cancel your registration 15 days prior to the start date of the event, the full amount will be reimbursed (less a handling charge of 100 €). After this deadline, no refunds will be given. If needed, the event registration can be changed to a substitute attendee. In this case, no cancellation fees or extra costs occur.

PRELIMINARY SCHEDULE

TIME AND SPEAKER	TOPIC
Monday, 20th April 2015	
08:00 – 08:15	**Welcome**
08:15 – 10:00 Dr. S. Krzack	**Introduction to gasification processes** - Terms and definitions of thermochemical conversion - Mechanism and reactions of gasification - Thermodynamic and kinetic aspects of gasification - Conversion criteria - Process classification
10:30 – 12:00 D. Reichel	**Fuels for gasification processes** - Fuel classification and characterization - Fuel analyses - Sample preparation - Characterization and chemical analyses of solid, liquid and gas samples from technical plants - Relevance of feed properties for gasification processes
12:00 – 13:00	**Lunch**
13:00 – 17:00 (15 min coffee break included) C. Higman	**Overview on industrial gasification technologies** - Description of principal characteristics of different gasification reactors (e.g. bed types, feed systems, syngas cooling systems, etc.) with advantages and disadvantages of each - Review of major commercialized and near commercialized systems - Process selection: criteria, process and summary
18:00 – 22:00	**Evening event**

TIME AND SPEAKER	TOPIC
Tuesday, 21st April 2015	
08:00 – 10:00 L. Waldheim	**Industrial gasification technologies for biomass** - Worldwide overview about gasification technologies for biomass - Characteristics / technical data (e. g. fuel input, kind of fuel, application, reactor principle etc.) for the different technologies - Feedstock related problems during biomass gasification
10:30 – 11:30 A. Laugwitz	**Introduction into flowsheet simulation of gasification processes** - General basics on flowsheet modelling - Common software packages - Detailed view on a standard software (e.g. ASPEN Plus®) - GUI and process units of the software - General modelling approach - Examination of general dependencies between input variations and gasifier performance (e.g. sensitivity analysis)
11:30 – 12:30	**Lunch**
12:30 – 14:30 Dr. A. Richter	**CFD modelling of gasification** - Fundamentals - Physical sub processes: particle modelling; heterogeneous / homogeneous reactions; turbulent flows - Software overview
15:00 – 17:00 F. Mehlhose	**Technical tour to Siemens FGT GmbH & Co. KG**
18:30 – 20:30 (combined with diner) Dr. J. van Dyk *African Carbon Energy*	**Evening Presentation Underground Coal Gasification (UCG)** - What is UCG? - Comparison of UCG with other gasification technologies - History of UCG and current global activities - Environmental and UCG (emissions, groundwater, etc.) - Viability of UCG projects - Coal characterisation for UCG - UCG towards products - Future R&D needs

TIME AND SPEAKER	TOPIC
Wednesday, 22nd April 2015	
08:00 – 10:00 Dr. R. Pardemann	**Processes for gas purification and carbon capture** - Short overview about typical gas impurities (pollutants / contaminants and impurities / inerts) - Gas quality requirements (typical syntheses and IGCC) - General layout of gas purification chains - Fundamental separation mechanisms for gas purification - Scrubbing processes for the removal of acid gases (H_2S, CO_2) and removal of trace components - Overview gas conditioning - Criteria for choosing appropriate purification processes and design of gas purification process chains
10:30 – 11:30 Dr. S. Guhl	**Ash/Slag behaviour in gasification processes** - Chemical and physical properties of ash / slag - Description and modelling of ash / slag behaviour - Problems and solutions regarding ash / slag behaviour in gasification processes
11:30 – 13:00	**Lunch**
13:00 – 14:00 M. Klinger D. Reichel	**Visit of laboratories and test facilities** - Advanced lab equipment: thermo balances, x-ray analysis tools, thermo-optical measurement - Test facilities: pyrolysis apparatuses, drop-tube reactor
14:00 – 15:30 Dr. P. Seifert O. Schulze	**On-site visit of larger-scale test facilities / pilot plants**
15:30 – 15:45	**Closing ceremony**