Model meets Reality - Distillation Simulation at BASF

Distillation is the most mature and widely applied separation technology in chemical industry. BASF is a company operating about 2000 distillation columns all over the world. The mathematical modelling of distillation and its design and operation has a long tradition and was developed long before Big Data came into our mind. But, of course the rapid increase in computational efficiency also inspired chemical engineers in applying more and more sophisticated mathematical models in fluid separation design. In this lecture, various aspects of separation modelling used in BASF will be presented covering the description of:

- physical property data in simulation
- conceptual design of conventional or hybrid separations
- modeling of special distillation systems (like divided wall columns, reactive distillation, dynamic systems)
- parameter adaption for plant snapshots and miniplant experiments
- mass transfer in distillation and absorption.

Which improvements have been made in the past decades and where are the challenges of simulation models today in practical applications? Where do we still need improvements?

These questions will be discussed and illustrated by examples.

Dr. Regina Benfer

Regina Benfer studied Chemical Engineering at TU Dortmund where she received her Ph.D. at the Chair for Technical Chemistry of Prof. Dr. U. Onken. In 1990, she joined BASF SE and worked in different research areas in the division of chemical and process engineering. She developed special expertise in mixing of gas-liquid systems during her work in the team for reaction technology, which she led for 5 years.

Since 2008 Regina Benfer is responsible as a team leader for the development of distillation and reactive distillation processes at BASF SE, focusing on simulation and experimental investigations. She was involved in the development and industrial implementation of extractive or reactive distillation processes, divided wall columns and other distillation applications in BASF worldwide, especially in the field of petrochemical products.

She is involved in national working parties on mixing, separation, reaction technology and model-based process development as member and as referee. She has contributed to about 20 papers and conference presentations and 25 patents.