

Thursday July 16th, 2015 - 10:30

Via Terracini 28, Room 1-030

Pressure Swing Adsorption – Theory and Practice

Dr. Joachim Guderian

Talk summary

In recent years, the adsorptive air separation was established as one of the most important thermal separation processes for the generation of nitrogen and oxygen from air. Both the effects of equilibrium and kinetics can be applied for the separation of nitrogen and oxygen. Nitrogen can be enriched by an equilibrium effect in the adsorbed phase of zeolites, whereas oxygen remains in the gas phase. In contrast to zeolites, oxygen can diffuse much faster into the pores of carbon molecular sieves resulting in an enrichment of nitrogen in the gas phase.

In the talk, general properties of carbon molecular sieves and zeolites are presented. Using the example of the nitrogen PSA, commercial PSA processes will be depicted. Starting from an elementary concept, modern sophisticated operation strategies will be developed. It will become obvious, that developing of PSA processes is still a challenge for researchers and process engineers. The talk will illustrate a general concept of modelling equilibrium and kinetic mechanism of PSA processes and conclude with an outlook on cycle steady state models.

Short CV

Prof. Joachim Guderian (54) obtained his PhD in Process Engineering at the Technical University of Dortmund in 1992. In 1993 he became head of the department of adsorption technology at Fraunhofer UMSICHT. He left UMSICHT in 1999. After subsequent 15 years in the adsorption business in Germany and England, he became Professor for Chemical Engineering at the University of Applied Sciences in Münster. Prof. Guderian is internal member of the DECHEMA group "Adsorption".