



Studying Dynamic Behaviour of Ammonia Cracking Unit based on End-user and upstream requirements

Background

Cracking involves breaking down ammonia (NH_3) into nitrogen (N_2) and hydrogen (H_2) with the help of a catalyst, like nickel. This method produces hydrogen, which is essential for clean energy technologies like fuel cells. Ammonia is a hydrogen carrier because it has an energy density and is easier to store than liquid hydrogen.

Cracking ammonia when needed enables the generation of hydrogen, supporting the development of a hydrogen-based economy. Moreover, it is crucial for industries that rely on high-purity hydrogen, such as metal refining and semiconductor manufacturing, to highlight the importance of ammonia cracking in promoting energy solutions and advanced industrial processes.

Proceedings

- Review of Ammonia cracking chain (Ammonia Storage/Ammonia Cracking/Hydrogen Storage and Compression) Simulation models developed in ASPEN-HYSYS
- Studying Ammonia cracking chain in dynamic mode
- Developing a model based on the combination of ASPEN and Simulink
- Defining scenarios based on upstream/downstream expected fluctuations.

Requirements:

- Independent working style
- Clear documentation
- Interest in current environmental problems and possible solutions
- Master student in Chemical/Process Engineering
- Good knowledge of the ASPEN package
- Good knowledge of the Simulink-MATLAB
- Very Good English skills in writing and speaking

Beginn der Arbeit: sofort !

Supervisor and contact:

M.Sc. Amin Soleimani Mehr
Abt. Kraftwerksfeuerungen (KWF)

amin.soleimani-mehr@ifk.uni-stuttgart.de
Tel. 0711/685 68208, Raum 1.53