Increasing hydrophobicity of amine grafted polymers by chemical modification

Taking into account the increase of extreme weather phenomena, the long term consequences of the climate change become more aware to the public. However, currently there does not seem to exits any effective measure to reduce the concentration of the greenhouse gas carbon dioxide in the atmosphere (DAC). Even if adsorption processes seem promising, they lack for well designed adsorbents with respect to the requirements imposed by DAC. The commercially available adsorbent Lewatit shows promising properties in DAC applications. However, the co-adsorption of water on the amine-grafted polymers’ surface hinders an effective large scale application of this adsorbent.

![Figure 1: Chemical modification to reduce the co-adsorption of water on Lewatit.](image)

The aim of this work is to experimentally investigate possible chemical modifications to increase the hydrophobicity of the adsorbent and, thus, decrease the co-adsorption of water, allowing for an effective utilization of Lewatit in large scale DAC units.

**Learning objectives**

- Design and operation of adsorption experiments in a laboratory scale
- Comparison and evaluation of different chemical modifications of amine grafted polymers with respect to DAC applications
- Understanding of hydrophobicity’s influence on the multi-component adsorption process

Begin on request (earliest 01.2019)
(Language: German or English)