Membrane Materials and Processes

Block copolymer membranes for biogas upgrading

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Introduction

Polymer synthesis, modification and membrane material optimization is required to design novel polymer membranes that can withstand the presence of CO₂/CO/H₂S at high pressures and temperatures. Block copolymers have shown to be an interesting candidate for the separation of CO₂.

Project summary

Block copolymers have the potential to exhibit phase separation on a large scale when the individual blocks are not miscible. This feature can be exploited to create CO₂-phobic domains in a rigid matrix. This way it is possible to combine the advantages of different polymers and to create preferential pathways for CO₂ and increase CO₂ permeability. For this project new block copolymers are synthesized using RAFT polymerization. The phase separation behavior of these novel block copolymers is studied. Subsequently, membranes are prepared and characterized. Their gas separation performance under high pressure and temperature using gas mixtures including CO and H₂S is evaluated and related to the polymer properties and structure of the membrane.

Project goals

In this project you will have the freedom to focus more on the synthesis of novel block copolymers or you may choose to focus more towards the performance analysis of the membranes. There are many possibilities in different parts of the project, so we can tailor a project to your preferences. If you are interested do not hesitate to contact me for further information.

Contact information

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