Institute of Chemical Engineering

Determination of the effectiveness of commercial polymeric membranes for carbon dioxide separation

Publication date:	01.12.2021
Publication title:	Determination of the effectiveness of commercial polymeric membranes for carbon dioxide separation
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Journal information:	Desalination and Water Treatment

This paper presents both experimental results and model calculations concerning polymer membranes used for carbon dioxide separation. Experiments on a laboratory stand provided a reference for the modeling process and were then used to verify the results obtained from computational simulations. In the analyses, a 2-component gas mixture consisting of CO2 and N2 and a 3-component mixture containing additionally oxygen were used. Experimental work was conducted for commercial modules for air separation. Dimensionless parameters of the membrane module model such as pressure ratio, permeation number, ideal selectivity coefficients were used and determined in the model computations. The experimental results obtained for one of the studied modules were adapted for the other membrane module, differing in membrane surface area. The investigations allowed us to determine the effectiveness of a commercial polymeric membrane designed for air separation in the carbon dioxide removal process.

Metryczka