Carbon capture from mixed gases using hollow-fiber membranes:simulation and experiment

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A mathematical tank-in-series model is implemented to simulate membrane separations in MATLAB®. This model can be modified in a simple manner to include all common flow patterns(co, counter, cross-flow). Mixed-gas experiments (including CO_2 and N_2) are carried at a range of different conditions to evaluate membrane performance. The numerical model is tuned by varying the number of tanks used to represent the membrane and so that experimental results can be predicted in a reliable manner. In this way the model is able to predict membrane outlet conditions which fit well with experimental data for a range of different feed conditions. This model is expected to be useful for the optimization of membrane process based on the experimentally tested membranes.