

## Effect of novel surface modifying macromolecules on morphology and performance of polysulfone hollow fiber membrane contactor for CO<sub>2</sub> absorption

### Abstract

A novel surface modified Polysulfone (PSf) hollow fiber membrane was fabricated via dry-wet phased inversion process. surface modifying macromolecule (SMM) was used as additive in the spinning dope. The surface modified membrane showed large pore size, higher effective surface porosity, contact angle and porosity but lower critical water entry pressure (CEPw) compared to Polysulfone hollow fiber membrane without SMM. The performance of surface modified membrane in contactor application for CO<sub>2</sub> absorption via distilled water as absorbent was studied. The results show that surface modified membrane has higher performance compared to plain Polysulfone membranes. With the membrane prepared from SMM in the spinning dope a maximum CO<sub>2</sub> flux of  $5.8 \times 10^{-4}$  mol/m<sup>2</sup> s was achieved at 300 ml/min of absorbent flow rate, which was almost 76% more than the other membrane. In a long-term stability study, the initial flux reduction was found to be about 18% within the 50 h of operation for surface modified membrane.