**Application of osmotic membrane distillation for dehumidification**

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**ABSTRACT**

Technology of osmotic membrane distillation (OMD) was applied for dehumidification in this study. Water vapor moves from wet air to salt solution during OMD, leading to dehumidification. A hydrophobic membrane made of PVDF with an average pore size of 0.1 μm was used to separate the calcium chloride solution from wet air. An objective of this study was the evaluation of OMD feasibility for dehumidification. It was examined whether OMD was able to decrease the relative humidity of wet air below 60% (target value). The optimum operating conditions of OMD was sought. Concentration, temperature, and flow rate of the calcium chloride solution together with air flow rate were selected for this purpose, and their effects on dehumidification were examined. The operation stability of OMD dehumidification was also examined. While continuously operated at the determined optimum conditions over 34 h, OMD successfully transformed wet air into dry air. The dehumidification capacity deteriorated with time as the calcium chloride solution was diluted. The diluted salt solution was then regenerated using a direct contact membrane distillation.

Keywords: Dehumidification; Osmotic membrane distillation; Regeneration; Direct contact membrane distillation

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