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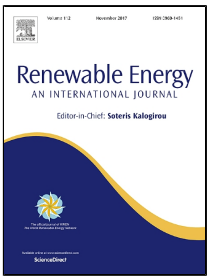

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Enhancement of Performance of Open Liquid Desiccant System with Surface Additive

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Abbreviated Title: Polycarbonate packed liquid desiccant system

Abstract

The aim of this study was to improve performance indices of open liquid desiccant system by using polycarbonate boards having higher surface tension and surface active additive. For this purpose, polycarbonate boards of 6 and 10 mm thicknesses creating two different surface areas were employed in the designed and manufactured open liquid desiccant system. For further investigation surface active additive which is based on polyether modified siloxane was used to reduce surface tension difference between packing and desiccant solution. LiCl-water was used as desiccant solution in the system. The effect of channel angle on the rate of mass transfer between liquid and gas was studied using packing materials packed with 30^o, 45^o and 60^o channel angles. The effects of air and desiccant flow rates on the performance of system were also determined. The absorber dehumidification efficiency was obtained as 85% at 1000 m^3/h air and 1.85 kg/s desiccant flow rates for 30^o channel angle and 6 mm thickness packing material.

Keywords: LiCl-water desiccant, novel packing material, dehumidification, air conditioning, surface tension

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