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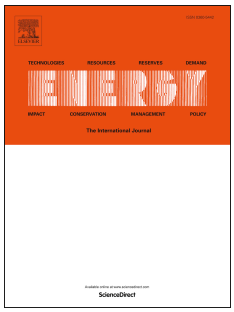

Factor analysis and optimization of operational parameters in a liquid desiccant air-conditioning system

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Factor analysis and optimization of operational parameters in a liquid desiccant air-conditioning system

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Abstract Liquid desiccant dehumidification systems are widely used in many industries including HVAC. Special attention has been paid to the liquid desiccant air conditioning (LDAC) system performance analyses. However, the studies, such as factor analysis and performance optimization of LDAC system, have not received enough attention. This paper focuses on the factor analysis and optimization of the operational parameters of a LDAC system that has been described in previous work. Firstly, through the process of factor analysis, the most important factors and pair-wise interactions can be selected, when Ex_{cd} is used as the target variable. Secondly, the optimum values for these factors that optimize Ex_{cd} are found by using the method of orthogonal design. Thirdly, a sectioned polynomial regression model is developed to describe the relationship between the Ex_{cd} and independent variables inclusive of the factors in the optimal combinations and the outdoor air parameters. With the variation of outdoor air parameters, the optimal values of t_{gen}