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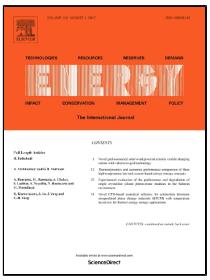

Performance analysis of a novel multi-function liquid desiccant regeneration system for liquid desiccant air-conditioning system

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PII:	S0360-5442(17)31467-6
DOI:	10.1016/j.energy.2017.08.092
Reference:	EGY 11461
To appear in:	*Energy*
Received Date:	18 April 2017
Revised Date:	16 August 2017
Accepted Date:	21 August 2017

Please cite this article as: Cheng Qing, Xu Wenhao, Performance analysis of a novel multi-function liquid desiccant regeneration system for liquid desiccant air-conditioning system, *Energy* (2017), doi: 10.1016/j.energy.2017.08.092

Performance analysis of a novel multi-function liquid desiccant regeneration system for liquid desiccant air-conditioning system

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Abstract

The liquid desiccant air-conditioning system (LDAS) is a novel air-conditioner with good energy saving potential. Regenerator is the key component of the liquid desiccant air-conditioning system, which is the main energy-consumed part. Electrodialysis regenerator is a new liquid desiccant regeneration method which can meet the dehumidification requirements even when the environment air is hot and wet. In this paper, in order to reduce the waste of electrode solution and the operational cost of normal electrodialysis regenerator, a novel multi-function liquid desiccant regeneration system was developed and investigated. Moreover, an experimental system was constructed to achieve the accurate current efficiency of the new system. The results show that in order to improve the current efficiency of the multi-function desiccant regeneration system, the operational current and the concentration difference between solutions in regenerate chambers and dilute chambers should be both decreased. The ideal performance coefficient of liquid desiccant air-conditioning system can exceed 7 when the conductivity of liquid desiccant is higher than 300mS/cm. In the practical application of the multi-function liquid desiccant regeneration system, the operational current will be designed to fulfill the hydrogen and halogen gas production of the system.

Keywords: Liquid desiccant; Regeneration; Multi-function; Production rate

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