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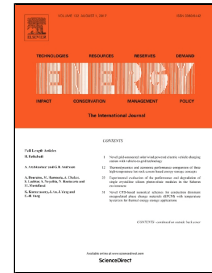
Performance analysis of a novel multi-function liquid desiccant regeneration system for liquid desiccant air-conditioning system

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

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7 **Abstract**

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

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

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