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An experimental study on the dehumidification performance of a counter flow liquid desiccant dehumidifier

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Highlights

- An experimental study on a compact packed-type dehumidifier is conducted.
- New empirical correlations for moisture and enthalpy effectiveness are developed.
- The present packing can reduce the size of dehumidifier to meet installation demand.
- The critical height of packing is proposed and it increases with desiccant flow flux.
- Packing height should not exceed 0.4m when desiccant flow flux is less than 1.3 kg/m²s.

ABSTRACT

This paper presents an experimental study on the dehumidification performance of a counter flow liquid desiccant dehumidifier using structured packing with a high specific surface area (650m²/m³). New empirical equations correlating the moisture effectiveness and the enthalpy effectiveness with critical inlet parameters are developed, which can be used to conveniently predict the performance of a similar dehumidifier. The empirical correlations are validated using the experimental data of this study, **and compared with the experimental data reported by another researcher**. The deviations are within $\pm 10\%$ for the former **and within $\pm 15\%$ for the latter**. **The performance of the present type of packing is also compared with other two types of structured packing available in**

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