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Determination of moisture mass diffusion coefficient for desiccant materials

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Separate Sensible and Latent Cooling (SSLC) systems have considerably improved performance compared to single vapor compression based system for moisture management in buildings. Such systems often deploy solid desiccant based dehumidifier to absorb the excess moisture from air streams. The steady state and transient characteristic of desiccant materials (micro, meso or nano porous structures) play critical role in establishing the performance of overall system. In current study the dynamic vapor sorption procedure has been used to evaluate the mass diffusion coefficient and steady state isotherms for a several porous materials and their potential to act as desiccant material has been investigated. The SEM images have been used to relate the pore size to associated moisture adsorption properties and appropriate model has been developed to relate the diffusion characteristics to the structure (pore size) of specific desiccant material.

References

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