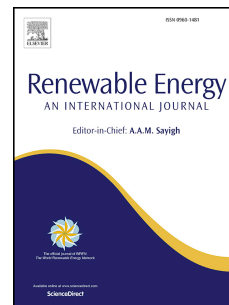


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Optimization of adsorption isotherm types for desiccant air-conditioning applications

Muhammad Sultan^{1,*}, Takahiko Miyazaki^{2,3}, Shigeru Koyama^{2,3}

¹Department of Agricultural Engineering, Bahauddin Zakariya University,
Bosan Road, Multan 60800, Pakistan

²Faculty of Engineering Sciences, Kyushu University, Kasuga-koen 6-1,
Kasuga-shi, Fukuoka 816-8580, Japan

³International Institute for Carbon-Neutral Energy Research (WPI-I²CNER),
Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan

***Corresponding Author: Muhammad Sultan, Dr.Eng.**

Emails: muhammadsultan@bzu.edu.pk

Tel: +92-333-610-8888

Abstract

The present study investigates five kinds of adsorbents for desiccant air-conditioning (DAC) applications. Each adsorbent yield distinctive water vapor adsorption isotherm that can be categorized as type-I, type-II, type-III, type-V, and type-linear on the basis of the International Union of Pure and Applied Chemistry (IUPAC) classification. Ideal DAC cycle is evaluated for the air-conditioning (AC) applications, and steady-state moisture cycled (MC_{SS}) is estimated by means of adsorption isobars. Results showed that the adsorbent enabling type-linear adsorption isotherm gives maximum MC_{SS} for industrial AC processes of matches manufacturing/drying/storage, rubber dipped goods storage and photo studio drying room. However, adsorbent enabling type-V adsorption isotherm is found the optimum adsorbent for tobacco stemming/stripping/softening and optical lenses grinding. For industrial AC process of dipped surgical articles; adsorbents enabling type-II, type-linear, and type-I adsorption isotherms

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