"Gheorghe Asachi" Technical University of Iasi, Romania

NUMERICAL STUDY OF DESICCANT WHEEL BEHAVIOR FOR ENVIRONMENTALLY FRIENDLY AIR CONDITIONING SYSTEM

Carmen Ema Panaite[*], Ioan Baisan, Aristotel Popescu

„Gheorghe Asachi" Technical University of Iaşi, Department of Mechanical and Automotive Engineering,
43 D. Mangeron Blvd., 700050, Iaşi, Romania

Abstract

Open-cycle desiccant air conditioning represents an attractive alternative to the classical method based on electric vapor compression. The performance of the rotary dehumidifier has a significant effect on the capability, size and cost of the whole air conditioning system. In the present paper a detailed two-dimensional mathematical model of coupled heat and mass transfer processes manifesting at the moist air-solid desiccant interface has been formulated. It was studied packed bed absorber of rotary wheel type under cyclic operating conditions. The numerical results lead to a good understanding of the adsorption/desorption processes and prediction of the desiccant wheel behavior.

Key words: desiccant wheel, mathematical modeling, solar air conditioning

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[*] Author to whom all correspondence should be addressed: e-mail: epanaite@tuiasi.ro; Phone +40752141220