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Preliminary Study of Desiccant Cooling System under Algerian Climates

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Abstract : The interest in air conditioning using renewable energies is increasing. The thermal energy produced from the solar energy can be converted to useful cooling and heating through the thermochemical or thermophysical processes by using thermally activated energy conversion systems. The ambient air contains so much water that very high dehumidification rates are required. For a continuous dehumidification of the process air, the water adsorbed on the desiccant material has to be removed, which is done by allowing hot air to flow through the desiccant material (regeneration). A solid desiccant cooling system transfers moisture from the inlet air to the silica gel by using two processes: Absorption process and the regeneration process. The main aim of this paper is to study how the dehumidification rate, the generation temperature and many other factors influence the efficiency of a solid desiccant system by using TRNSYS software. The results show that the desiccant system could be used to decrease the humidity rate of the entering air.

Keywords : dehumidification, efficiency, humidity, Trnsys
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