

Performance Evaluation of Vermiculite as Adsorbent Material for Solar-Assisted Air-Conditioning in Tropical Climate

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Abstract : Solar-adsorption air-conditioning system (SADCS) is an alternative to the conventional vapor compression system (VCS). SADCS have advantages over VCS system, such as 1) a green cooling technology which utilizes solar energy to drive the adsorption/desorption cycle, 2) can be operated using green refrigerant HFC free pure water, 3) mechanically simpler, and 4) lower operating noise level since it has no moving parts other than the magnetic valves. Several advancements have been achieved in these fields in the last decade, but further research is still needed to escalate this technology to a practical level. Hence, this paper presents a literature survey and a review that add insights into the current state-of-the-art of SADCS technologies with emphasis on the practical researches that were conducted at the laboratory scale and commercial level. In this paper, the performance evaluation of vermiculite as adsorbent material for SADCS in tropical climate discussed in comparison to other adsorbent material such as silica gel.

Keywords : adsorption cooling, solar-assisted cooling, HVAC, tropical climate, solar thermal

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