Modelling the Isosteric Heating Process in a Charcoal Bed of a Solar Powered Adsorption Cooling System

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Abstract: *This paper seeks to address a problem associated with Solar Powered Adsorption Cooling (SPAC) systems. The problem is the difficulty in knowing if the complete charcoal bed reaches desorption temperature during the isosteric heating process. In addressing the issue, the process is modeled and the results are compared with those from experiments. The temperature profile modeling of the isosteric-heating-process establishes a time-related formulation that gives the temperature, at any radius, across a cylindrical shaped bed comprising of charcoal/methanol pair of adsorbent/adsorbate; and the results from modeling compare favorably with the measured temperature profiles obtained from the experiments.*

Keywords: *Solar powered adsorption cooling; isosteric heating; thermal conductivity; renewable energy technology*