

## Modeling and Analysis of Solar Assisted Adsorption Cooling System Using TRNSYS

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**Abstract :** As a result of increase in world energy demand as well as the demand for heating, refrigeration and air conditioning, energy engineers are now more inclined towards the renewable energy especially solar based thermal driven refrigeration and air conditioning systems. This research is emphasized on solar assisted adsorption refrigeration system to provide comfort conditions for a building in Islamabad. The adsorption chiller can be driven by low grade heat at low temperature range (50 -80 °C) which is lower than that required for generator in absorption refrigeration system which may be furnished with the help of common flat plate solar collectors (FPC). The aim is to offset the total energy required for building's heating and cooling demand by using FPC's thus reducing dependency on primary energy source hence saving energy. TRNSYS is a dynamic modeling and simulation tool which can be utilized to simulate the working of a complete solar based adsorption chiller to meet the desired cooling and heating demand during summer and winter seasons, respectively. Modeling and detailed parametric analysis of the whole system is to be carried out to determine the optimal system configuration keeping in view various design constraints. Main focus of the study is on solar thermal loop of the adsorption chiller to reduce the contribution from the auxiliary devices.

**Keywords :** flat plate collector, energy saving, solar assisted adsorption chiller, TRNSYS

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