

# **SIMULATION OF SOLAR LITHIUM BROMIDE–WATER ABSORPTION COOLING SYSTEM WITH DOUBLE GLAZED FLAT PLATE COLLECTOR FOR ADRAR**

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**ABSTRACT.** Adrar is a city in the Sahara desert, in southern Algeria known for its hot and dry climate, where a huge amount of energy is used for air conditioning. The aim of this research is to simulate a single effect lithium bromide–water absorption chiller coupled to a double glazed flat plate collector to supply the cooling loads for a house of 200m<sup>2</sup> in Adrar. The thermal energy is stored in an insulated thermal storage tank. The system was designed to cover a cooling load of 10.39KW for design day of July. Thermodynamic model was established to simulate the absorption cycle. The results have shown that the collector mass flow rate has a negligible effect on the minimum required collector area, but it has a significant effect on the optimum capacity of the storage tank. The minimum required collector area was about 65.3 m<sup>2</sup>, which could supply the cooling loads for the sunshine hours of the design day for July. The operation of the system has also been considered after sunset by saving solar energy.

**KEYWORDS:** *solar, cooling, absorption, double glazed flat plate, bromide-water, energy, cooling, Adrar.*