

**PERFORMANCE AND EVALUATION OF ADSORPTION CHILLERS
POWERED BY SOLAR ENERGY BY MEANS OF PTC'S IN JORDAN**
N. ABU SHABAN^(a), A.MAAITAH^(b), A. SALAYMEH^(c),

^(a)Al-Zaytoonah university,
PO Box 130 Amman, 11733, Jordan
aboshaban65@yahoo.com

^(b) Ayman A. Al-Maaitah
American University of Madaba
PO Box 2882

Amman, Jordan 11821
a.maaiyah@aum.edu.jo

^(c) Jordan university, Amman, 11942, Jordan
salaymeh@ju.edu.jo

ABSTRACT

An innovative idea is developed to increase the total output of CSP system and to improve its financial feasibility. The CSP system which is utilizing the DNI by means of PTC's is assembled to form a tri-generation solar system which is built and tested in the southern part of Jordan. With only one solar matrix the heat generated was used to generate electricity, distilled water, and cooling in summer or heating in winter. The system is comprised of a parabolic trough solar matrix installed on the roof of 6000 m² building with total aperture area of 240m². The trough matrix heated thermal oil up to 260 °C which is used to generate superheated steam at 13.7 bar, and 210 °C. The generated steam powers a 20 HP steam engine which drives a 15KWe DC generator. The steam exiting the engine at 120 °C is then utilized to evaporate brackish water as it is condensed to complete the power cycle. The distillation process is then completed to generate distilled water at a peak rate of 150 liters/hr. The heat rejected from the distillation process is then stored in a thermally insulated hydraulic storage tank and used to heat the space in winter or to power an innovative two-stage air cooled adsorption chiller at a capacity of 20KW of cooling at 12 °C chilled water output and 35 °C ambient. The performance of the adsorption chillers was conducted and determined, the COP and the normalized capacity of these chillers were obtained.