World Academy of Science, Engineering and Technology
International Journal of Energy and Power Engineering
Vol:12, No:09, 2018

Performance of an Absorption Refrigerator Using a Solar Thermal Collector

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Abstract : In the present paper, we investigate the feasibility of a thermal solar driven cold room in Gabes, southern region of Tunisia. The cold room of 109 m³ is refrigerated using an ammonia absorption machine. It is destined to preserve dates during the hot months of the year. A detailed study of the cold room leads previously to the estimation of the cooling load of the proposed storage room in the operating conditions of the region. The next step consists of the estimation of the required heat in the generator of the absorption machine to ensure the desired cold temperature. A thermodynamic analysis was accomplished and complete description of the system is determined. We propose, here, to provide the needed heat thermally from the sun by using vacuum tube collectors. We found that at least 21m² of solar collectors are necessary to accomplish the work of the solar cold room.

Keywords : absorption, ammonia, cold room, solar collector, vacuum tube
Conference Title : ICESET 2018 : International Conference on Energy Systems Engineering and Technology
Conference Location : Tokyo, Japan
Conference Dates : September 10-11, 2018

Open Science Index, Energy and Power Engineering Vol:12, No:09, 2018 publications.waset.org/abstracts/99221.pdf