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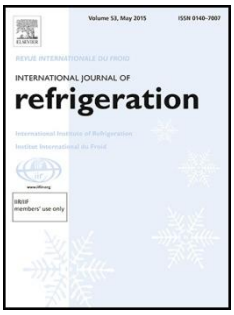

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Experimental investigation on the performance of a solar powered lithium bromide-water absorption cooling system

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Highlights

- The cooling and space heating performance of the system was experimental investigated.
- The cooling performance of the system influent by running temperature was analyzed.
- The cooling performance of the system influent by cooling temperature was analyzed.
- The improvement methods for the system were analyzed and discussed.

Abstract: The Performance of solar cooling absorption system needs further research, due to its poor coefficient of performance (COP).Therefore; this study investigated the performance of a 23 kW solar powered single-effect lithium bromide-water (LiBr-H_2O) absorption cooling system. Furthermore, the space heating mode was also investigated and the improvement methods were analyzed and discussed. The cooling system was driven by a parabolic trough collector of 56 m^2 aperture area and used for cooling a 102 m^2 meeting room. Research results revealed that the chiller's maximum instantaneous refrigeration coefficient (chiller efficiency) could be up to 0.6. Most of the time, in sunny and clear sky days the daily solar heat fraction ranged from 0.33 to 0.41 and the collectors field efficiency ranged from 0.35 to 0.45. At the same time, chiller efficiency was varied from 0.25 to 0.7 and the daily cooling COP was varied from 0.11 to 0.27, respectively.

Keywords: Solar cooling; Single-effect absorption chiller; Lithium Bromide-water; Parabolic trough solar collector (PTC); Cooling performance

Nomenclature

Symbols

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