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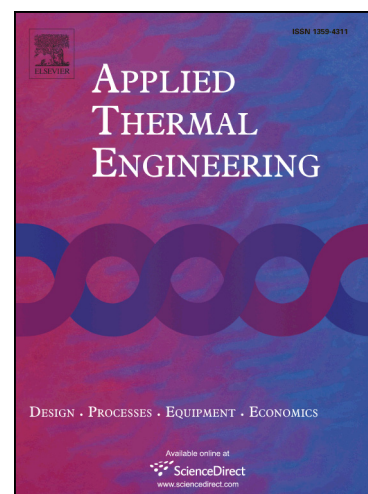
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## Thermodynamic and thermoeconomic analyses of two stage hybrid absorption compression refrigeration system

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### Abstract

In this paper a two stage hybrid absorption compression refrigeration system utilizing LiBr-H<sub>2</sub>O as working fluid is proposed. The hybrid system is compared thermodynamically with the conventional two stage absorption refrigeration system and it is found that the former can be operated at lower generator temperature and performs better than the latter. The effects of various operating parameters on thermodynamic and thermoeconomic performance indices like exergetic efficiency, area of heat exchangers and cost of the system are also studied. The heat exchangers are designed to estimate the size and cost of the system. The objective of thermoeconomic optimization is the minimization of annual cost of system, which includes investment costs and exergy fuel costs. The optimized hybrid system has COP of 0.43 and exergetic efficiency of 11.68%. The optimization results in the reduction of heat exchangers area from 79.61 m<sup>2</sup> to 71.96 m<sup>2</sup> and annual cost of operation of hybrid system by 5.2%.

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