عنوان مقاله:

Sensitivity analysis of an ejector enhanced absorption refrigeration system based on exergy and economic concepts

محل انتشار:

دومین کنگره بین المللی زمین، فضا و انرژی های پاک با محوریت مدیریت منابع طبیعی ، کشاورزی و توسعه پایدار (سال: 1395)

تعداد صفحات اصل مقاله: 15

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خلاصه مقاله:

In this work, the exergetic and exergoeconomic analyses are conducted for two cascade refrigeration systems. The proposed systems are made up two subsystems, i.e. vapor compression and LiBr/water absorption refrigeration cycle (system 1) equipped with an ejector (system 2). Flat plate solar collectors are applied to provide the required energy of the systems. Parametric study are carried out to assess the exergetic and economic performances of both system. Results show that the cooling load and the exergetic performance in system 2 increase 65.3% and 65% on average, relative to system 1. Moreover, the maximum exergetic coefficient of performance is calculated for R1234ze in systems 1 and 2 within 0.39571% and 0.6463%, respectively. Economic modeling shows in average 65.3% increment in the minimum total product cost in system 2 relative to system 1. Furthermore, the minimum total product cost is obtained for R134a by about 6629 $/year and 8790 $/year, respectively. In this study, the effect of several major design parameters, such as volume fraction of nanoparticles, collector area, collector tilted angle and low pressure are studied on the exergetic and economic performances of the both systems. A parametric study showed that the nanoparticle volume fraction has a positive effect on the exergetic performances while the collector and low pressure have negative effects on both systems. Moreover, the nanoparticle volume fraction and the collector area have a negative effect on the minimum total product cost and the collector tilt angle and low pressure have a positive effect on it.

کلمات کلیدی:

solar energy, cascade refrigeration, ejector, exergy