

SENSITIVITY ANALYSIS OF A LOW GRADE ENERGY ASSISTED LiBr-H₂O ABSORPTION COOLING SYSTEM

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Abstract

The demand of energy for cooling application is ever increasing due to technology development and the rapid increase in world population. Dependence on high grade electrical energy for cooling has increased environmental concerns like global warming and ozone layer depletion. Therefore there is need for harvesting the cooling technologies primarily govern by renewable energy source which are environmental friendly as well. In current study, a low grade energy powered, single stage, absorption cooling system, using a water–lithium bromide solution, is simulated to analysis the sensitivity of pressure, temperature and concentration on the coefficient of performance (COP). The four components of cycle are examined for the variation in COP corresponds to the change in pressure and concentration. The pressure parameter is varied in condenser and evaporator, resulting graph shows that the increment in pressure of evaporator increases the COP whereas increment of pressure in condenser decreases the COP. The sensitivity of COP corresponds to the LiBr solution reveals its increment at lower inlet concentration to the absorber. The exergy analysis discusses the effect of ambient temperature on COP of the system in respect to the cooling water, chilled water and hot water supply.

Keywords : Absorption cycle, Sensitivity, Coeffiecnt of Performance, Exergy

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