Thermal Analysis of Absorption Cooling System by Machine Learning Method

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Abstract

In this paper, an absorption cooling system (ACS), based on the solution of lithium bromide-water absorption refrigeration cycle, is analysed. The ACS is characterized by utilisation of intermedium-pressure (IP) extraction steam from the steam turbine for its operation. The thermal analysis of the ACS is set up in detail, based on a machine-learning algorithm, which is validated by using real process data. Real process data was obtained by measurement of the ACS. The results show that the ACS generates 19.9 kW of cold for district cooling and 297 kW of heat for heating of demineralized water. During this time, the ACS for operation consumed an average of 0.06 kg/s of IP steam and operated with a 17.3% average exergy efficiency. The average exergy efficiency of the ACS can be improved by using lower-quality of operation steam or even hot water.