International J. of Engg. Research & Indu. Appls. (IJERIA). ISSN 0974-1518, Vol.4, No. II (May 2011), pp 359-373

MATHEMATICAL MODELLING FOR COMPUTER SIMULATION OF DIFFERENT MODELS OF AMMONIA WATER ABSORPTION REFRIGERATION SYSTEMS

S. S. CHOUGULE, A. T. PISE, A. S. CHAVAN, G. S. KAMBLE, P. V. MULIK AND M. M. NARKE

Abstract

The ammonia-water absorption refrigeration system is attracting research interests, since the system can be powered by waste heat energy. The system is also avoiding use of ozone-depletion refrigerants and reducing demand of electricity supply. With the continuous development of absorption systems, there has been a growing need for effective system simulation. In this article, mathematical models coupled with detailed equations for thermodynamic properties of an ammonia-water mixture are described. Computer simulation software based on the models is developed. With the software, the performance characteristics of ammonia water absorption refrigeration systems are analyzed for four different models and detailed optimum performance graphs for the systems are plotted. The simulation tool provides useful information for designing such new system and guides in choosing appropriate operating conditions for existing systems.

Keywords: Vapour absorption refrigeration system, ammonia water (aqua ammonia), simulation, mathematical model, computer software and optimization.

C Ascent Publication House: http://www.ascent-journals.com