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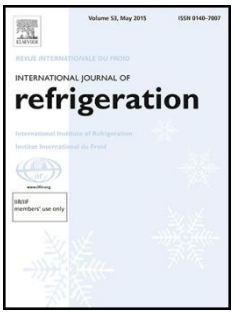

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Thermodynamic Modelling and Parameter Determination of Ejector for Ejection Refrigeration Systems

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Highlights

- A detailed thermodynamic modelling of an ejector for ejection refrigeration was presented;
- Experimental results were introduced to determine the hypothetical throat area ratio;
- The hypothetical throat area ratio was correlated with nozzle throat area ratio and pressure ratio;
- Linear correlation of hypothetical throat area ratio was given for dry working fluid;
- Polynominal correlation of hypothetical throat area ratio was given for steam;
- Two-phase sound speed equation played an important role when the working fluid was not dry;

Abstract

This paper presents a detailed thermodynamic modelling method of an ejector for ejection refrigeration system. In this model, the primary flow in the ejector was assumed to fan out from the nozzle without mixing with the secondary flow in a certain downstream distance, so that a hypothetical throat was formed where the secondary flow reached the sound speed. However, the area of this hypothetical throat remained unknown. Therefore, based on several sets of experimental results, the present study developed empirical correlations of the hypothetical throat area to aid further modelling. The ratio of the hypothetical throat area to the mixing area was correlated with two dimensionless variables: one was the ratio of nozzle throat area to the mixing area, and the other one was the primary

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