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Analysis of CO_2 Two-Phase Ejector with Taguchi and ANOVA Optimization and Refrigerant Selection with Enviro Economic Concerns by TOPSIS Analysis

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Abstract : Ejector refrigeration cycles offer an alternative to conventional systems for producing cold from low-temperature heat. In this article, a thermodynamic model is presented. This model has the advantage of simplifying the calculation algorithm and describes the complex double-throttling mechanism that occurs in the ejector. The model assumption and calculation algorithm are presented first. The impact of each efficiency is evaluated. Validation is performed on several data sets. The ejector model is then used to simulate a RES (refrigeration ejector system), to validate its robustness and suitability for use in predicting thermodynamic cycle performance. A Taguchi and ANOVA optimization is carried out on a RES. TOPSIS analysis was applied to decide the optimum refrigerants with cost, safety, environmental and enviro economic concerns along with thermophysical properties.

Keywords : ejector, velocity distribution, shock circle, Taguchi and ANOVA optimization, TOPSIS analysis
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