Experimental analysis and development of fuzzy model for the prediction of COP and mass flow rate in air-conditioning system

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Abstract

A research endeavor is currently underway to examine the experimental analysis and development of a fuzzy model aimed at predicting the Coefficient of Performance (COP) and Mass Flow Rate within the parameters of a refrigeration process utilizing a novel refrigerant blend with nano additive materials was used. Through the application of Fuzzy logic methodology, the inquiry has pinpointed the process parameters that exhibit the most advantageous outcomes in attaining an elevated COP, alongside diminished values for compressor discharge temperature, compressor power, and mass flow rates. The investigation delves into the potential utilization of a blend comprising R152a, R290, R600, and R600a with nano particle of Al_2O_3. Validation of the projected outcomes was carried out through confirmation tests, which have deemed the results to align precisely

with the anticipated values. The principal objective of this empirical investigation is to evaluate the operational efficacy of a residential window air conditioning unit when contemplating the substitution of R-22 with a blend of R152a, R290, R600, and R600a with nano particle of Al_2O_3.

Data availability

Not applicable.

Code availability

Not applicable.

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Contributions

GK and AP contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

T.S and G.J wrote the paper with input from all authors.

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Ethics declarations

Competing interests

The authors declare no competing interests.

Ethics approval

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Not applicable

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Conflict of interest

The author declare no competing interests.

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