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Unsteady exergy analysis for a recycle and recovery machine

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Highlights

- Analysis exergy for a 2R machine is proposed
- The best design for a 2R machine is based on unsteady process
- Exergy destruction is highly determined by the mass flow rate of refrigerant
- To avoid excessive exergy destruction, should be the recovery time when RTR already 50g

Abstract: Machine 2 R is necessary in order to avoid the release of refrigerant during the repair of an air conditioning machine. The main goals of this paper are to determine the rate of exergy transfer, the rate of exergy destruction and the rate of exergy change in the compressor, condenser, oil separator and 2R machine. This study also determines the performance of the 2 R machine. Pressure, temperature and mass of the refrigerant were measured every 0.5 minutes for 10 minutes. In conclusion, the results of this analysis show that the rate of destruction exergy in the compressor is 59.98%, and in the condenser 25.37%. The value of the Residual Trapped Refrigerant (RTR) of recycling and recovery machine meets the AHRI standard, that is, 34 grams, and the value of the Refrigerant Loss (RL) complies with the AHRI standard, which is 10 grams, while its performance is 91.2%.

Keywords: Refrigeration, Exergy, Exergy Destruction, Energy, Entropy

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