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Performance analysis of a combined vapor compression cycle and ejector cycle for refrigeration cogeneration

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Highlights:

- Waste heat utilization can reduce emissions of carbon dioxide.
- A hybrid vapor compression refrigeration system (HVCR) with CO₂ is proposed.
- The effects of some thermodynamic parameters on the cycle performance are evaluated.
- The work shows that the HVCR system is quite promising.

ABSTRACT:

A hybrid vapor compression refrigeration (HVCR) system, which combines a vapor compression refrigeration (VCR) system and an ejector refrigeration (ER) system, was developed. The waste heat energy from the gas cooler in the VCR system is applied as driven source towards ER system.

Thermodynamic investigations on the performance of the HVCR system, using CO₂ as a refrigerant, are performed with energetic and exergetic methods, and the comparative analyses with the VCR system are conducted. Comprehensive effects of key operating parameters on the system performance are also studied. The results indicate that for the same cooling

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