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Experimental research on the performance of the diffusion absorption refrigerator with mixed fluoride refrigerants

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Highlights

- Mixed fluoride refrigerants were experimentally employed in a DAR system.
- Low refrigerating temperature (-28.8°C) was achieved.
- The generating temperature could be as low as 83.3°C.

Abstract

A diffusion absorption refrigerator (DAR) operating with mixed fluoride refrigerants was built to obtain low refrigerating temperature at low generating temperature. Two groups of mixed fluoride refrigerants, R23/R134a and R23/R32/R134a were tested experimentally. The N, N-dimethylformamide (DMF) and helium were used as the absorbent and inert gas, respectively. For the DAR with R23/R134a, the refrigerating temperature was not obviously influenced by the concentration of R23 in the mixed refrigerant vapor or the amounts of helium. For the DAR with R23/R32/R134a, an optimal concentration of R32 in the mixed refrigerant vapor and an optimal pressure were both found to achieve the lowest refrigerating temperature which was -28.8°C at a generating temperature of 106.9°C, and a refrigerating temperature of -23.7°C was obtained at an extraordinarily low generating temperature of 83.3°C. It showed the promising potentials of DAR

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