

Abstract for ICR2003

Title: Performance characteristics of air cycle heat pumps working with moist air

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Abstract:

As the environmental issues become serious due to synthetic refrigerants used for refrigeration systems, the use of natural substance as refrigerant, so-called natural refrigerants, is promoted in many refrigeration systems. The potential natural substances as refrigerant are hydrocarbon, carbon dioxide, ammonia, water, air and so on. In this paper the air cycle heat pump systems using air as refrigerant are focused, and the ways to improve its performance are discussed. As one of the ways, we propose to use moist air instead of dry air and its performance characteristics are examined theoretically and experimentally. As a result, heating capacity and the expansion power increase with the increase of the humidity at the compressor inlet, which leads to the improvement of the cycle coefficient of performance. The heat pump system with moist air suctioning can be one of promising applications of the air cycle.