

Hybrid 히트펌프의 성능 및 중요인자에 관한 연구

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Performance and Major Parameter Investigation of a New Hybrid Heat Pump Cycle

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Key Words: Un-utilization energy(미활용에너지), Hybrid Heat pump(Hybrid 열펌프)

Abstract : The utilization of unused energy is important because it can afford to offer a chance to increase energy efficiency of a heat pump system. Especially the waste energy recovery by heat pump can be easily utilized in industrial field for processing water supply system. In this article, the efficient way to make a high temperature water by using the waste water as heat source. This article concerns such a cycle that its system making up has the features: a two-stage compression, a two stage expansion and two desorbers, each of which being located after an expansion valve. By comparisons of the performance with those of common two-stage compression and single expansion CAHP systems for four heating cases, the simulation studies showed that the new system has superior performance, under the working conditions of lower compressor outlet temperature and lower maximum system pressure, which is very important for the components of the system to be operated safely. And the performance can be improved further by optimum displacements of the compressors chosen. The simulations also demonstrated how changes of the sink temperature glide, maximum pressure and the performance of the system were adjusted by the circulation rate and the ammonia concentration for a given heat case.

열교환기 내장형 어큐물레이터의 성능특성에 관한 해석적 연구

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CFD Simulation on the Performance Characteristics of Accumulator Heat Exchangers

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Key Words: AHX(열교환기 내장형 어큐물레이터), Accumulator(어큐물레이터), Inner heat exchanger(내부열교환기), Multi air-conditioner(멀티에어컨)

Abstract : An AHX(Accumulator Heat eXchanger) consists of a commercial accumulator and an inner heat exchanger located inside of the accumulator. The AHX is used in multi air-conditioners to assure the liquid-phase refrigerant entering into the expansion device, which is achieved by heat transfer between the refrigerant leaving the evaporator and the refrigerant leaving the condenser. In this study, a CFD simulation on the heat transfer and pressure drop in the AHX using R-22 as a working fluid, is conducted. The simulation was performed with various accumulator inner volume and liquid line length to show geometrical effects on the heat transfer and pressure drop characteristics.