

전력-냉각-담수생산을 위한 카리나냉각사이클과 통합한 다효과담수화공정 타당성 평가

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This paper presents a tri-generation system to produce power, cooling, and freshwater using a low grade heat source. A Kalina power-cooling cycle with ejector (KPCE) is coupled with a multi-effect distillation plant (MED), where the waste heat from the KPCE is used to feed the MED. In this system (KPCE-MED), the turbine exhaust supplies the heat to MED. Because KPCE can supply heating steam for MED with little affecting on the performance, not only the energy loss is lower than KPCE but also a large quantity of fresh water is generated. The system is modeled thermodynamically to determine the performance. The results showed thermal and power-cooling efficiencies of 8.5% and 14.1%, for the KPCE-MED system. Parametric analysis and optimization reveals the great effect of high and middle pressures on freshwater production, total annual cost and performance.

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