Thermodynamic and economic analysis of combined low-temperature multi-effect evaporation (LT-MEE) desalination system with heat pumps

Iman Janghorban, 유창규*
경희대학교
(ckyoo@khu.ac.kr*)

In this study, two desalination systems which combine low-temperature multi-effect evaporation (LT-MEE) desalination system with two kind of heap pumps were compared in view point of energy and economic. In the first desalination system, LT-MEE system is combined with water/lithium bromide absorption heat pump (LiBr-H2O ABHP) and in the second system LT-MEE system is combined with steam jet ejector (SJE). Mathematical and economic models were developed to calculate energy consumption and unit product cost of the fresh water for the combined systems. The sensitivity analysis-based energy was conducted to evaluate the effect of the key thermodynamic parameters including the last effect brine salinity, first effect temperature, and motive steam pressure on the system performance.
Acknowledgements: This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012-001400).