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SeaHERO core technology and its research scope for a seawater reverse osmosis desalination system

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ABSTRACT

Seawater reverse osmosis (SWRO) desalination is considered one of the most promising technologies for supplying freshwater to the regions suffering from water scarcity. Although a considerable amount of research has been conducted in attempts to improve SWRO desalination technology, reducing the cost of producing freshwater is still required. In Korea, this effort is already been being carried out by the Seawater Engineering & Architecture of High Efficiency Reverse Osmosis (SeaHERO) project. Core Technology 2 (CT2), one of the most important sub-projects out of four CTs under SeaHERO, pursues two main goals: optimization of processes for low energy consumption/high efficiency and localization of core parts/equipments of the SWRO plant. Four unit technologies (UTs) are then incorporated into CT2 and each UT has its own technical target; UT1 focuses on the development of SWRO desalination system integration and optimization technology in terms of energy saving; UT2 and 3 work to develop high performance RO membranes and 16-inch modules with polyamide-type materials and novel (i.e., non-polyamide) materials, respectively; UT4 works to develop a high-pressure/massive-capacity pump and hydrostatic energy recovery device for a high efficiency SWRO plant. Accordingly, the integration of the four UTs of CT2 in the SeaHERO project is expected to contribute to reducing the cost and energy consumption in producing freshwater from seawater using the SWRO process.

Keywords: SeaHERO; Core Technology 2; Process optimization; Membrane; Pump; Energy recovery

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