Energy-saving wastewater treatment process integrated with heat pump

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In a water removal process, distillation technology is regarded as a representative process. Steam provides latent heat to wastewater and auxiliary cooling water supply system in needed to condense the water vapor evaporated by steam. The large energy demand of the distillation process implied that the process is uneconomical and cannot be commercialized actively.
In this work, energy-saving wastewater treatment process integrated with heat pump (mechanical vapor recompression (MVR)) was investigated. Freon gas mixture of R-32, R-125, R-134a was used as refrigerants. Experimental data under some operating conditions is simulated by using ASPEN PLUS V9.0. The energy demand of the proposed process is decreased by _% compared to typical distillation process. Sensitivity analysis was conducted to suggest future research directions to improve the energy efficiency of the process.