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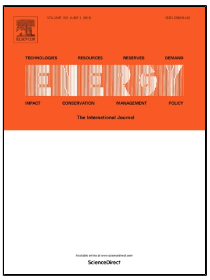

Simulation and Modeling of MEG (Monoethylene Glycol) Regeneration for the Estimation of Energy and MEG Losses

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Simulation and Modeling of MEG (Monoethylene Glycol) Regeneration for the Estimation of Energy and MEG Losses

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Abstract

MEG (Monoethylene glycol) is a hydrate inhibitor used for the recovery of subsea oil and gas. For practical and economic reasons, it is necessary to extract and re-use the MEG through a regeneration unit which removes hydrocarbons, water and salts. The economic performance of regeneration process depends on MEG losses and the amount of heat and power required for the separation. Since recovering as pure MEG as possible without disturbances induced by salts is important to maintain process sustainability, this study focuses on the modeling and simulation of salt and water removal steps, including the prediction of hydrate inhibitors required for subsea condition. Also, design methods presented in this study systematically provide identification of appropriate configurations and operating conditions, with which the economic performance concerning MEG loss and energy consumption can be systematically evaluated. Models are developed in process simulators and validated with industrial data. Hydrate inhibitor recovery of 99.42% from the reclamation unit considered in this study is comparable to typical recoveries reported in commercial processes in the range of 99.4% ~ 99.5%. It is also found that energy used for the separation of MEG from water in re-concentration unit accounts for at least 60% of total energy consumption.

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