Membrane operations for produced water treatment

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ABSTRACT

Growing energy demand associated with improved living standards and rising population has increased the consumption of petroleum-based energy sources. To bridge the gap between demand and supply of petroleum-based energy resources, enhanced oil recovery and exploration of new nonconventional resources including shale gas, coal bed methane gas, and tight gas have gained popularity. These new techniques, however, use relatively fresh water and produce huge volumes of highly contaminated produced water. From compositional and potential treatment options, bilge water can also be included in the category of produced water. This work provides an overview of the investigations carried out for the removal of oil and greases using a membrane bioreactor and various other membrane operations. An analysis of a current and future scenario of produced water generated through conventional and nonconventional sources of energy and the perspective of produced water treatment in Saudi Arabia are also given. Finally, a cost estimation for the treatment of produced water using membrane operations is discussed.

Keywords: Produced water; Produced water treatment; Membrane operations

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