

Separation of Oil from Produced Water by Adsorption on Pinecone Powder

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Abstract

Canada has one of the world's largest produced water discharges. Alberta alone accounted for 229 million cubic meters of produced water in 2001. The presence of oil in water makes it challenging to reuse in steam assisted gravity drainage (SAGD) operations. Several stages of water treatment are required to make water reusable, albeit 100 % removal of oil is still a challenge. This study aims to separate entrained crude oil from produced water by adsorption using pinecone based sorbent material. Pinecone is abundantly available, inexpensive, and renewable natural resource found in Canada. Adsorption capability of pinecone for different oil-containing produced water mixtures (250 mg/l to 750 mg/l), pH (2 to 11), sorbent concentrations (0.1g to 0.3g / 200 ml of adsorbate) and time (0 to 3.5h), has been studied at ambient temperature and pressure. Synthetic produced water is prepared using crude oil 28.21 API and 5-wt% NaCl. The concentration of oil in produced water is estimated through UV-vis spectroscopy. Also, the kinetics and adsorption isotherms were established for the oil removal-using pinecone sorbent. The results of this study will be presented and discussed during the Wilson Basin Conference.

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