

Reaction of oil sand with CO₂

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The conventional oil reserves are near to deminished so there is a growing need to develop unconventional oils such as heavy oil and bitumen from oil sands. In terms of recoverable oil, oil sands are considered to be the largest oil reserves in the world. Because of the extremely high viscosities, a variety of novel in-suit recovery methods using combinations of steam, solvents, surfactants, are being investigated. However, the upgrading of bitumen from oil sands to synthetic crude oil (SCO) requires nearly ten times more hydrogen than the conventional crude.

In this paper we study the reaction of oil sand with CO₂. The reaction is carried out in high pressure batch type reactor. The reaction conditions such as temperature, pressure, contact time and the feed/catalyst ratio were optimized. The reaction is carried out with and without catalyst. Separation and chemical analysis was also investigated using high performance chromatography (HPLC) and thermo gravimetric analysis (TGA). Generally oil sand consist of a four major groups indentified as saturates, aromatics, resins and asphaltenes (SARA). The HPLC method discussed in this paper achieves a separation of bitumen in to its class components (SARA).