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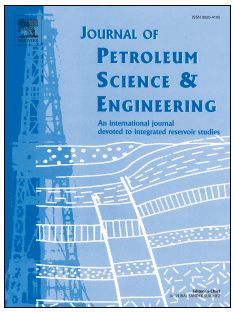

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Removal and Prevention of Asphaltene Deposition during Oil Production: a Literature Review

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Abstract

The problems associated with asphaltene deposition generate significant production loss and involve expensive corrective measures. The deposition of asphaltenes greatly reduces the productivity of the affected wells, and in some cases stops the well from flowing after a complete plugging of production column, it may also obstruct surface production facilities. This article reviews the different factors influencing the deposition of asphaltenes. The main problems caused by asphaltene deposition are presented in this work. Our focus will be on the current methods to fight these problems through the removal and the prevention of asphaltene deposition. Among the objectives of this review study is to provide an overview of current asphaltene inhibitors and dispersants that have been used in the literature. Finally, this paper sheds light on the strategy to control and minimize asphaltene deposits by inhibitors or dispersants to avoid any harmful consequence that will be happened later because of asphaltene deposits.

Keywords: asphaltene deposition, oil production, correctives measures, removal, prevention.

1. Introduction

Asphaltenes are the heaviest and most polar fraction of crude oil. They are polyaromatic molecules surrounded by aliphatic and heteroatomic chains (N, O, S), they can have also metals (Fe, Ni, V) (Speight, 2004); where their chemical composition varies from crude oil to other one as shown in table.1; where the asphaltene isolated from Iraq crude oil has not Azote in its elemental composition(DeCanio et al., 1990) in compared with the elemental composition of Kuwaitian asphaltenes (Ancheyta et al., 2002), this table regroups also the chemical composition of asphaltenes extracted from Aranian(Sato et al., 2005), Canadian(Ibrahim and Idem, 2004) and Chinese(Chen et al., 2012) crude oils; they have the same chemical elements and metals, but their tenors change following the source of crude oil.