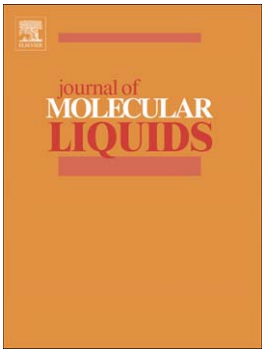

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Ionic Liquids as Alternatives of Surfactants in Enhanced Oil Recovery-A State-of-the-Art Review

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Abstract

Generally, surfactants are used to be considered as effective candidates in chemical enhanced oil recovery due to their high-level performances of interfacial tension reduction and wettability alteration. After a few laboratory experiments, a chemical namely "ionic liquids" has immensely attracted the attention of the researchers for further characterization of the candidate, before taking a decision about sound alternatives of surfactants in enhanced oil recovery. Available research works have already marked them as "green chemicals" for a downstream petroleum refinery. But again several issues should be considered to use this specific term for ionic liquids as many of them are toxic and non-biodegradable.

The present review provides an overview of available works on ionic liquids and their effectiveness in enhanced oil recovery. A thorough discussion has been provided on the selection of ionic liquids that is a very crucial issue for the effectiveness of an ionic liquid in oil recovery methods. Laboratory works mainly focused on the characterization and their applications in interfacial tension reduction, wettability alteration and core flooding experiments for additional oil recovery, were documented in this review, although few in numbers. Available literature indicates the effectiveness of ionic liquids in the reduction of interfacial tension, additional oil recovery in core flooding experiments and wettability alteration of oil-wet rock surfaces. The future challenge of newly synthesized chemicals like active ionic liquids for oil recovery has also been discussed. It is believed that the present review will provide a platform for the new researchers to get an overview of the applications of surface active ionic liquids in chemical enhanced oil recovery techniques. The information provided in this critical review paper will help to explore the topic deeply and make the progress of work smoothly.