the solvent contributes significantly to the overall cost of the formulation. The solvent is needed to maintain what is referred to as aqueous stability (which is the stability of the surfactant formulation diluted in the reservoir brine). Reducing the amount of solvent required is advantageous.

A number of patents and patent applications have discussed methods for enhanced oil recovery using surfactant flooding. In addition to the use of surfactants, there are a number of patent and patent applications discussing the use of co-surfactants and sacrificial agents for enhanced oil recovery.

Hsu et al., U.S. Patent No. 6,022,843 discloses an improved concentrated surfactant formulation and process for the recovery of residual oil from subterranean petroleum reservoirs, and more particularly an improved alkali surfactant flooding process which results in ultra-low interfacial tensions between the injected material and the residual oil, wherein the concentrated surfactant formulation is supplied at a concentration above, at, or, below its critical micelle concentration, also providing in situ formation of surface active material formed from the reaction of naturally occurring organic acidic components with the injected alkali material which serves to increase the efficiency of oil recovery.

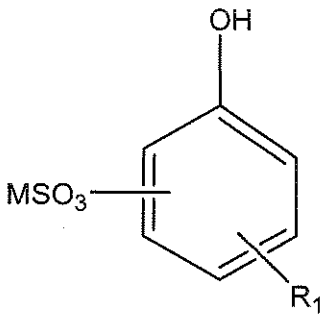
Berger et al., U.S. Published Patent Application No. 2005/0199395A1 discloses an oil recovery process and a particular class of alkylaryl sulfonate surfactants. The surfactants are derived from an alpha-olefin stream having a broad distribution of even carbon number ranging from 12 to 28 or more.

A general treatise on enhanced oil recovery is Basic Concepts in Enhanced Oil Recovery Processes edited by M. Baviere (published for SCI by Elsevier Applied Science, London and New York, 1991).

SUMMARY OF THE ~~INVENTION~~DISCLOSURE

The present ~~invention~~disclosure is directed to an enhanced oil recovery composition comprising

(a) a surfactant comprising an alkylated hydroxyaromatic sulfonate having the general formula:



wherein R_1 is an alkyl group containing from about 8 to 40 carbon atoms and having from about 20% to about 50% methyl branching, and M is a mono-valent cation;

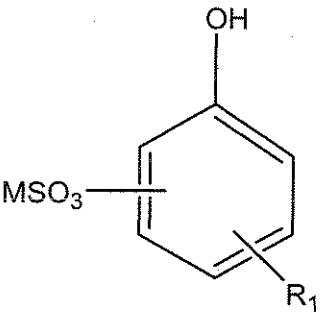
(b) a solvent;

(c) a passivator; and

(d) a polymer.

The present ~~invention~~disclosure is also directed to a method of making an enhanced oil recovery composition comprising mixing

(a) a surfactant comprising an alkylated hydroxy aromatic sulfonate having the general formula:



wherein R_1 is an alkyl group containing from about 8 to 40 carbon atoms and having from about 20% to about 50% methyl branching, and M is a mono-valent cation;

(b) a solvent;

(c) a passivator; and

(d) a polymer.

The present ~~invention~~disclosure is also directed to a method of recovering crude oil from a subterranean hydrocarbon-containing formation which comprises