cosurfactant comprising an ethoxylated n-alcohol which possesses from about 12 to about 15 carbon atoms.

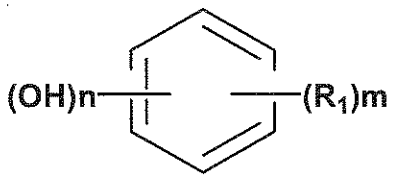
Campbell et al., U.S. Patent No. 6,989,355 discloses an under-neutralized alkylxylene sulfonic acid composition for enhanced oil recovery processes. This invention is also directed to a method for enhancing the recovery of oil from a subterranean reservoir which method employs the underneutralized alkylxylene sulfonic acid compositions of the present invention. The under-neutralized alkylxylene sulfonic acid compositions are employed in an aqueous media. The method optionally employs suitable co-surfactants, such as alcohols, alcohol ethers, polyalkylene glycols, poly (oxyalkylene)glycols and/or poly(oxyalkylene)glycol ethers.

Parker, U.S. Patent No. 4,816,185 discloses reaction products C_9-C_{30} alkylbenzenes with styrene and sulfonated derivatives thereof and processes for preparing such products and derivatives. The sulfonate salts of reaction products are especially useful as detergents.

SUMMARY OF THE ~~INVENTION~~DISCLOSURE

In its broadest embodiment, the present disclosure~~invention~~ is directed to

A process for preparing an alkylated hydroxyl aromatic compound comprising reacting (a) a hydroxyl aromatic compound (I), having the following structure;



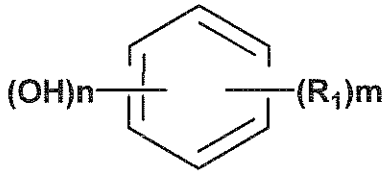
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wherein n 1, 2 or 3; m is 0, 1, 2, or 3 and R_1 is Hydrogen or hydrocarbyl group. and

(b) at least one β-branched primary alcohol component in the presence of an alkylating catalyst thereby producing an alkylated hydroxyl aromatic compound.

In one aspect, there is provided a process for preparing an alkylated hydroxyl aromatic compound comprising reacting

(a) a hydroxyl aromatic compound (I), having the following structure;

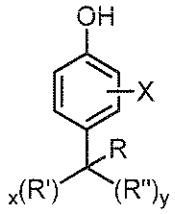


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wherein n 1, 2 or 3; m is 0, 1, 2, or 3 and R_1 is Hydrogen or hydrocarbyl group and

(b) at least one β-branched primary alcohol in the presence of an ionic liquid catalyst or an acidic alkylating catalyst selected from the group consisting of natural zeolites, synthetic zeolites, synthetic molecular sieves, clays, and ion exchange resins, thereby producing an alkylated hydroxyl aromatic compound wherein the alkylated hydroxyl aromatic compound comprises at least about 65 to 98 weight percent of a para-substituted hydroxyl alkylated aromatic isomer.

In one embodiment, the disclosure~~invention~~ is directed to an alkylated hydroxyl aromatic compound having the following structure:



wherein X can be either hydrogen, an aliphatic chain or an hydroxyl group depending on the structure of the aromatic material alkylated and wherein R is methyl or hydrogen and either when R is hydrogen, then x+y= 7 to 49 or when R is methyl, then x+y= 6 to 48; wherein R' and R" are alkyl, having from about 8 to about 50 carbon atoms.

DETAILED DESCRIPTION OF THE INVENTION

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are herein described in detail. It should be understood, however, that the description herein of specific embodiments is not intended to limit the invention to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

Definitions

The term "hydrocarbyl" refers to an organic radical primarily composed of carbon and hydrogen which may be aliphatic, alicyclic, aromatic or combinations thereof, e.g., aralkyl or alkaryl. Such hydrocarbyl groups may also contain aliphatic unsaturation, i.e., olefinic or acetylenic unsaturation, and may contain minor amounts of heteroatoms, such as oxygen or nitrogen, or halogens, such as chlorine. When used in conjunction with carboxylic fatty acids, hydrocarbyl will also include olefinic unsaturation.

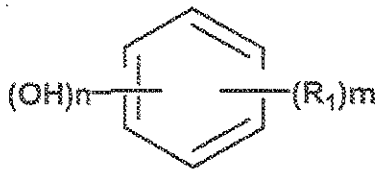
The term "alkyl" refers to both straight- and branched-chain alkyl groups.

One embodiment of the present invention is a process for preparing an alkylated hydroxyaromatic compound comprising (a) reacting at least one hydroxyl-containing aromatic compound with at least one β-branched primary alcohol component that is

WHAT IS CLAIMED IS:

1. A process for preparing an alkylated hydroxyl aromatic compound comprising reacting

(a) a hydroxyl aromatic compound (I), having the following structure;



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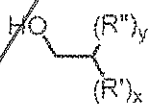
wherein n 1, 2 or 3; m is 0, 1, 2, or 3 and R_1 is Hydrogen or hydrocarbyl group. and

(b) at least one β-branched primary alcohol component in the presence of an alkylating catalyst thereby producing an alkylated hydroxyl aromatic compound.

2. The process according to Claim 1 wherein the hydroxyl aromatic aromatic compound is phenol.

3. The process according to Claim 2 wherein the alkylated hydroxyl aromatic compound comprises at least about 65 to 98 weight percent of a para-substituted hydroxyl alkylated aromatic isomer.

4. The process according to Claim 1 wherein the at least one β-branched primary alcohol component has the following structure:



wherein R' and R'' are hydrocarbyl groups and wherein x and y represent the number of carbons present in the hydrocarbyl moeity and $6 \leq x + y \leq 48$

5. The process according to Claim 1 wherein the at least one β-branched primary alcohol component comprises from about 8 to about 50 carbon atoms.

6. The process according to Claim 5 wherein the at least one β-branched primary alcohol component comprises from about 12 to about 40 carbon atoms.

7. The process according to Claim 5 wherein the at least one β-branched primary alcohol component comprises from about 12 to about 20 carbon atoms.

8. The process according to Claim 1 wherein the alkylating catalyst is an acidic catalyst.

9. The process according to Claim 8 wherein the acidic catalyst is selected from the group consisting of natural zeolites, synthetic zeolites, synthetic molecular sieves, clays, and ion exchange resins.

10. The process according to Claim 9 wherein the an acidic catalyst is an ion exchange resin catalyst.

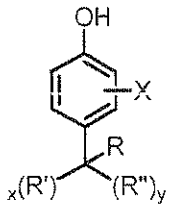
11. The process according to Claim 10 wherein the ion exchange resin catalyst is Amberlyst 70®, Amberlyst 36 ® or Dowex M-31®.

12. The process according to Claim 9 wherein the acidic catalyst is a natural zeolite or a synthetic catalyst.

13. The process according to Claim 8 wherein the alkylating catalyst is an ionic liquid catalyst.

14. An alkylated hydroxyl aromatic compound prepared by the process according to Claim 1.

15. An alkylated hydroxyl aromatic compound having the following structure:

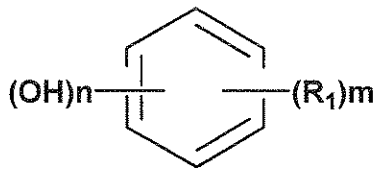


wherein X can be either hydrogen, an aliphatic chain or an hydroxyl group depending on the structure of the aromatic material alkylated and wherein R is methyl or hydrogen and either when R is hydrogen, then x+y= 7 to 49 or when R is methyl, then x+y= 6 to 48; wherein R' and R" are alkyl, having from about 8 to about 50 carbon atoms.

CLAIMS

1. A process for preparing an alkylated hydroxyl aromatic compound comprising reacting

(a) a hydroxyl aromatic compound (I), having the following structure;



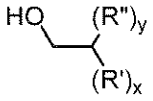
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wherein n 1, 2 or 3; m is 0, 1, 2, or 3 and R_1 is Hydrogen or hydrocarbyl group and

(b) at least one β-branched primary alcohol in the presence of an ionic liquid catalyst or an acidic alkylating catalyst selected from the group consisting of natural zeolites, synthetic zeolites, synthetic molecular sieves, clays, and ion exchange resins, thereby producing an alkylated hydroxyl aromatic compound wherein the alkylated hydroxyl aromatic compound comprises at least about 65 to 98 weight percent of a para-substituted hydroxyl alkylated aromatic isomer.

2. The process according to Claim 1 wherein the hydroxyl aromatic compound is phenol.

3. The process according to Claim 1 wherein the at least one β-branched primary alcohol has the following structure:



wherein R' and R'' are hydrocarbyl groups and wherein x and y represent the number of carbons present in the hydrocarbyl moiety and $6 \leq x + y \leq 48$.

4. The process according to Claim 1 wherein the at least one β-branched primary alcohol comprises from about 8 to about 50 carbon atoms.

5. The process according to Claim 4 wherein the at least one β-branched primary alcohol comprises from about 12 to about 40 carbon atoms.

6. The process according to Claim 4 wherein the at least one β-branched primary alcohol comprises from about 12 to about 20 carbon atoms.

7. The process according to Claim 1 wherein the an acidic catalyst is an ion exchange resin catalyst.

8. The process according to Claim 1 wherein the acidic catalyst is a natural zeolite or a synthetic catalyst.