~~What is claimed is:~~The Claims defining the invention are as follows:

1. A process for preparing a bridged alkaline earth metal alkylphenate, comprising reacting:

(a) a 4-alkylphenol, unsubstituted at the *ortho* positions,

(b) an alkaline earth metal oxide or hydroxide,

(c) a bridging agent comprising sulfur or a carbonyl compound of 1 to ~~-~~about 6~~, or to 4 or to 2,~~ carbon atoms, and

(d) a 2,6-dialkylphenol;

wherein the amount of the 2,6-dialkylphenol is about 0.05 to about 3 moles ~~, or 0.1 to 1.3, or 0.25 to 1.25 moles~~ per 1 mole of the 4-alkylphenol; provided that if there is a molar excess of the 2,6-dialkylphenol, then such excess is added after initial reaction of the 4-alkylphenol with alkaline earth oxide or hydroxide, the bridging agent, and no more than 1 mole of the 2,6-dialkylphenol per mole of the 4-alkylphenol.

2. The process of ~~c~~Claim 1, wherein the 4-alkylphenol comprises 4-dodecylphenol.

3. The process of C~~c~~laim 1 or ~~c~~Claim 2, wherein the alkaline earth metal oxide or hydroxide comprises calcium hydroxide.

4. The process of any one of ~~c~~Claims 1 to 3, wherein the bridging agent comprises ~~sulfur or formaldehyde or both sulfur and~~ formaldehyde.

5. The process of ~~claim 4~~any one of Claims 1 to 3, wherein the bridging agent comprises ~~both~~ sulfur ~~and formaldehyde, wherein, sulfur is supplied to the reaction mixture initially and thereafter formaldehyde is supplied~~.

~~6. The process of claim 5 wherein dialkylphenol is supplied to the reaction mixture along with the formaldehyde.~~

~~7.~~6. The process of any one of ~~c~~Claims 1 to ~~6~~5, wherein the 2,6-dialkylphenol comprises 2,6-di-t-butylphenol.

7. The process of any one of ~~c~~Claims 1 to ~~6~~7, wherein the amount of the 2,6-dialkylphenol is about 0.15 to about 0.5 moles per 1 mole of the 4-alkylphenol.

8. The process of any one of Claims 1 to 6, wherein the amount of the 2,6-dialkylphenol is about 0.15 to 1 mole per mole of the 4-alkylphenol.

~~8.~~9. The process of Claim 8, wherein the bridging agent comprises sulfur.

9.10. The process of any one of ~~c~~Claims 1 to 8, wherein the amount of the bridging compound is about 0.8 to about 4 moles per 1 mole of the 4-alkylphenol and wherein the amount of the alkaline earth metal oxide or hydroxide is about 0.1 to about 4 moles per 1 mole of the 4-alkylphenol.

~~10.~~11. The process of any one of C~~c~~laims 1 to ~~9~~ 10, wherein the components (a) through (d) are reacted at about 150 °C to about 230 °C for about 2 to about 10 hours.

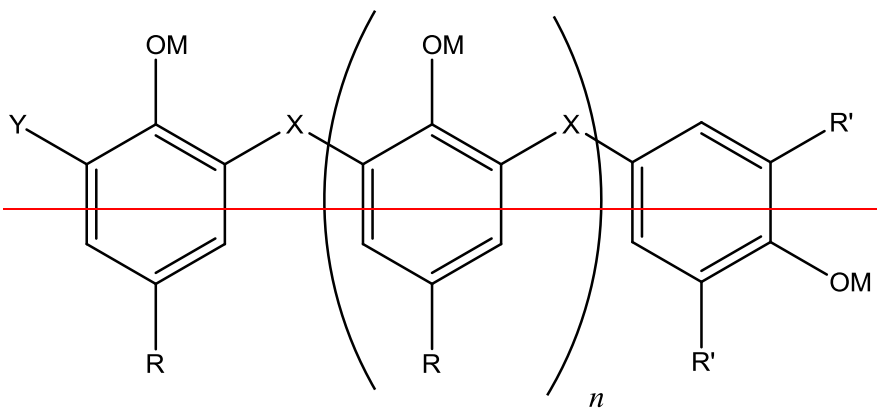
~~11.~~12. The process of any one of ~~c~~Claims 1 to ~~10~~11, wherein the 4-alkylphenol is reacted with at least a portion of the alkaline earth metal oxide or hydroxide and at least a portion of the bridging agent prior to addition of the 2,6-dialkylphenol.

~~12.~~13. The process of C~~c~~laim ~~11~~ 12, wherein, in a first step, about 0.1 to about 0.4 moles of calcium hydroxide and about 1 to about 3 moles of sulfur (as S_1), per mole of the 4-alkylphenol, are reacted with the 4-alkylphenol at about 170 to about 230 °C for about 3 to about 7 hours, and thereafter about 0.05 to about 0.5 moles of additional calcium hydroxide, about 0.25 to about 0.8 moles of additional sulfur, and about 0.15 to about 0.5 moles of the 2,6-dialkylphenol, per mole of the 4-alkylphenol, are added and reacted at about 150 to about 230 °C for about 1 to about 5 hours.

~~13.~~14. The process of any one of C~~c~~laims 1 to ~~12~~13, wherein the reaction is conducted in the presence of a solvent ~~which optionally comprises ethylene glycol~~.

15. The process of any one of ~~c~~Claims 1 to ~~13~~14, wherein the product of the reaction is subsequently treated with a molar excess of alkaline earth metal oxide or hydroxide and ~~optionally further treated~~ with carbon dioxide, thereby providing an overbased detergent.

~~14. A bridged alkaline earth metal alkylphenate represented by the formula~~



~~where n is 0 to 9;~~

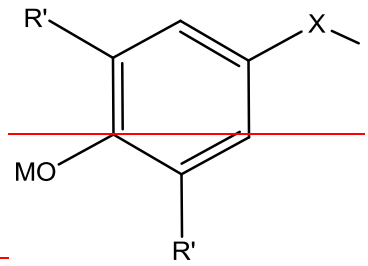
~~each M is independently hydrogen or a bond to a metal ion, provided that at least one M represents a bond to an alkaline earth metal ion;~~

~~each R is independently an alkyl group of 10 to 30 carbon atoms;~~

~~each R' is independently an alkyl group;~~

~~X is S_x or an alkylene group of 1 to 4 carbon atoms, where x is 1 to 4, or 1 to 2, or 1; and~~

~~Y is H or SH or a group represented by the formula~~



~~15.~~

16. The process of any one of Claims 1 to 15, wherein the product of the reaction is subjected to vacuum stripping.

17. The product of the process of any one of Claims 1 to 16.

18. A lubricant composition comprising an oil of lubricating viscosity and an akylphenate prepared by the process of any one of Claims 1 to 16.

19. The lubricant composition of Claim 18, wherein the alkylphenate is present in an amount of about 0.1 to about 8 percent by weight.

20. A method of lubricating a mechanical device, comprising supplying thereto the lubricant composition of Claim 18 or Claim 19.

21. The method of Claim 20, wherein the mechanical device comprises an internal combustion engine.