

WHAT IS CLAIMED IS:

1. A process for producing an over-based sulfurized alkaline earth metal phenate which comprises reacting either a mixture of reaction materials comprising a phenol, a dihydric alcohol, an alkaline earth metal reagent which is an alkaline earth metal oxide or hydroxide or a mixture of both, and sulfur or a mixture of these reaction materials with water, distilling off an excess amount of the dihydric alcohol and at least excess amount of water, and subsequently treating the resulting distillation residue with carbon dioxide, wherein the carbon dioxide treatment is carried out (A) in the presence of 0.001 to 0.7 mol of a fatty acid or a fatty amine per 1 mol of the alkaline earth metal reagent and (B) in the presence of either (i) 0.01 to 0.9 mol of water per 1 mol of the alkaline earth metal reagent or (ii) 0.05 to 5.0 mol of a lower alcohol containing 1 to 4 carbon atoms per 1 mol of the alkaline earth metal reagent or (iii) both of (i) the water and (ii) the lower alcohol.
2. The process as claimed in Claim 1, wherein the phenol is a phenol having a hydrocarbon side chain of 4 to 36 carbon atoms.
3. The process as claimed in Claim 1, wherein the alkaline earth metal reagent is an oxide or hydroxide of calcium, barium, strontium or magnesium.

4. The process as claimed in Claim 1, wherein the alkaline earth metal reagent is used in amount of 0.01 to 0.99 equivalent per one equivalent of the phenol.
5. The process as claimed in Claim 1, wherein the dihydric alcohol is ethylene glycol or propylene glycol.
6. The process as claimed in Claim 1, wherein the dihydric alcohol is used in an amount of 0.15 to 3.0 mol per mol of the alkaline earth metal reagent.
7. The process as claimed in Claim 1, wherein the sulfur is used in an amount of 0.001 to 3.0 mol per mol of the alkaline earth metal reagent.
8. The process as claimed in Claim 1, wherein the water is added in an amount of about 0.01 to 10 mol per mol of the alkaline earth metal reagent at the metal addition reaction stage.
9. The process as claimed in Claim 1, wherein the fatty acid is used in an amount of 0.05 to 0.6 mol per mol of the alkaline earth metal reagent and the fatty amine is used in an amount of 0.05 to 0.4 mol per mol of the alkaline earth metal reagent.
10. The process as claimed in Claim 1, wherein the fatty acid is selected from the group consisting of capric acid, lauric acid, palmitic acid, stearic acid, behenic acid, lignoceric acid, cerotic acid, montanic acid, and melissic acid and the fatty acid amine is selected from the group consisting of decylamine, undecylamine, dodecylamine,

tridecylamine, tetradecylamine, pentadecylamine, hexadecylamine, heptadecylamine, and stearylamine.

11. The process as claimed in Claim 1, wherein the carbon dioxide treatment is carried out in the presence of 0.1 to 0.5 mol of water per mol of the alkaline earth metal reagent and 0.1 to 1.5 mol of a lower alcohol containing 1 to 4 carbon atoms per mol of the alkaline earth metal reagent.

12. The process as claimed in Claim 1, wherein the lower alcohol containing 1 to 4 carbon atoms is selected from the group consisting of methyl alcohol, ethyl alcohol, n-propyl alcohol, i-propyl alcohol, and n-butyl alcohol.

13. The process as claimed in Claim 1, wherein the metal addition reaction or the carbon dioxide treatment is carried out in the presence of a diluent.

14. The process as claimed in Claim 1, wherein the carbon dioxide treatment is carried out at a reaction temperature of 50 to 230°C under a pressure of 0.01 to 51 atm^A.

15. An over-based sulfurized alkaline earth metal phenate having a base number of 250 to 400 mgKOH/g, a viscosity of 40 to 1,000 cSt at 100°C and a color of L3.0 to 8.0Dil (by ASTM), and contains 0.1 to 50 wt% of the fatty acid or the fatty amine based on the total amount thereof, which is produced by a process which comprises reacting either a mixture of reaction materials comprising a phenol, a dihydric alcohol, an alkaline earth metal reagent which is an alkaline earth metal oxide or hydroxide or a mixture of both, and

sulfur or a mixture of these reaction materials with water, distilling off an excess amount of the dihydric alcohol and at least excess amount of water, and subsequently treating the resulting distillation residue with carbon dioxide, wherein the carbon dioxide treatment is carried out (A) in the presence of 0.001 to 0.7 mol of a fatty acid or a fatty amine per 1 mol of the alkaline earth metal reagent and (B) in the presence of either (i) 0.01 to 0.9 mol of water per 1 mol of the alkaline earth metal reagent or (ii) 0.05 to 5.0 mol of a lower alcohol containing 1 to 4 carbon atoms per 1 mol of the alkaline earth metal reagent or (iii) both of (i) the water and (ii) the alcohol.

[ORIGINAL CLAIMS 16 and 17 HAVE BEEN DELETED]