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Research Paper :

A novel short oil alkyd resin based on coconut oil and rosin for detergent compositions

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ABSTRACT

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Alkyd resin is normal raw material for paints, printing inks, and water thinable coatings. In the present work, we have successfully prepared a very short oil alkyd using high proportion of rosin, the other ingredient are coconut oil, maleic anhydride and glycerol. Various parameters like temp., time of heating and mole ratio have been studied. All the sample have been analyzed for physiochemical characteristics like acid value saponification Value, HLB ratio, viscosity, and cleaning performance on soil cloth. Two samples AR-1, AR-2, have given good result so these samples have been used after neutralization with KOH in powder detergent and liquid detergent compositions. These polymer are based on vegetable origin like coconut oil, glycerol and rosin. The above result indicates that novel short oil alkyd can be used as replacement of crude petroleum based acid slurry and Alpha Olefin Sulphonate. The use of coconut oil and rosin gives good foaming and cleaning properties. The price of this material is slightly lower than conventional petroleum based actives. This product will also support green chemistry as the raw materials are of vegetable origin.

KEY WORDS: Alkyd polymer, Detergent powder, Detergency evaluation, Alkyd resin, Resin

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novel polymeric surfactant based on coconut oil¹, Amaleic anhydride² and rosin³ has been synthesized, technically it is a rosinated short oil alkyd resin⁴. Short oil alkyd resin has been successfully used as polymeric surfactants in various powder and liquid detergents. In the piece of research work, the mole ratio, catalyst and heating schedule has been standardized to get on alkyd resin with higher acid value, desired hydrophiliclipophilic ratio (HLB)⁵, Viscosity and solubility characteristics.

In the present work, an effort has been made to replace crude petroleum based acid slurry and alpha olefin sulphonate (AOS) with novel polymers. The composition of two selected polymers was found to be useful for powder and liquid detergents (Table 1). The special feature of our polymers is used of 50 to 60 per cent rosin which is abundantly available and prices are quite stable. The other ingredients are minor proportions *i.e.* coconut oil 25 to 30 per cent, glycerol 10 per cent and maleic anhydride 7.5 per cent. The combined used of rosin and coconut oil gives good foaming and cleaning properties.

EXPERIMENTAL METHODOLOGY Experimental:

Preparation of short of alkyd resin :

This resin was prepared in a three neck glass reactor fitted with stirrer and condenser and temperature control of $+2 \,{}^{\circ}$ C. A novel catalyst 1.5 per cent sodium bisulphate and 0.5 per cent sodium bisulphate has been used for this reaction. The composition, cooking schedule and analysis of alkyd polymer is given in Table 2.

Preparation of detergent powders:

Detergent powder was prepared in a laboratory blender mixer and finally moisture content of 14-15 per cent has been maintained in finished powder. Two samples of detergent powder have been prepared one based totally on an alkyd polymer and in other composition 50 per cent of alkyd polymer has been replaced by alpha olefin sulphonate and acid slurry.

Surface tension⁶:

The surface tension of powder detergents was measured using stalagnometer.