

PALM-BASED ESTERQUATS AS SUBSTITUTE FOR DI-TALLOW DIMETHYL AMMONIUM METHO SULFATE⁻

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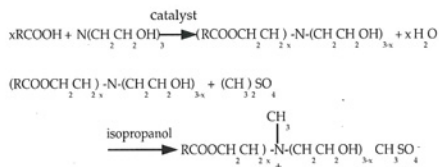
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MPOB (formerly known as PORIM) has evaluated the potential of palm-based esterquats fatty acids to replace the conventional tallow-based esterquats as the main ingredient in fabric softening formulation. Many surfactant processing companies in the world are shifting from the conventional distearyl dimethyl ammonium compounds to the more biodegradable esterquats. As Malaysia has abundant supply of palm oil, we foresee its potential to replace the animal-based raw material.

PROCESS

The esterquats manufacturing process involves two simple reactions. The first reaction is condensation between fatty acids and triethanolamine giving mixtures of mono-, di- and tri-ester of triethanolamine. Water is released as by-product. The second reaction is the quaterization of the former mixtures with an alkylating agent in monohydric alcohol to give quaternized triethanolamine ester (generally known as esterquats) (Figure 1).



where,

R = long chain alkyl group (C12- C18)

x = integer 1 to 3



PROPERTIES OF PALM STEARIN ESTERQUATS

Appearance	:	Straw-coloured paste
Active matter	:	0.90 - 0.95 meq/g
pH value of 5% solution	:	2.30 - 3.50
Solid content	:	90-93% in isopropanol
Colour (Gadner)	:	3
Viscosity	:	@ 50°C: 250 cps

(Brookfield viscometer, LVT,
Spindle No. 4, Spindle speed: 30 rpm) @ 40°C: 800 cps

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