

Synthesis of Carboxylate Gemini Surfactant

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Abstract : A carboxylate Gemini surfactant N, N`-bis (3-chloro-2 -hydroxypropane-N-dodecyl secondary amine) p-phenylenediamine diacetate sodium (GD12-P-12) was synthesized by substitution and ring-opening reaction from p-phenylenediamine, sodium chloroacetate, epichlorohydrin, and dodecylamine. The synthesis conditions were optimized by controlling variables. The structure of GD12-P-12 was characterized by FT-IR and 1H NMR, and its foam performance, interfacial tension, viscosity was evaluated. The results show that the molecular structure of the synthesized product is consistent with that of the target product, the GD12-P-12 can reduce the oil-water interfacial tension to $7.49 \times 10^{-3} \text{mN/m}$ (ultra-low interfacial tension level) in 20min. GD12-P-12 surfactant has excellent foam performance, ultra-low interfacial tension, good temperature-resistant viscosity-increasing properties, has good application prospect in foam flooding.

Keywords : gemini surfactant, optimization of synthesis conditions, foam performance, low interfacial tension

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