

## Ionic-Nonionic Surfactants

Sir: Reference is made to the article by Muto et al., entitled "Influence of Nonionic Surfactant Additive on the Properties of Ionic Surfactant Solutions (JAOCS 49:437 [1972]).

May I call the attention of your readers to the following related reports that were originally available from the Armed Services Technical Information Agency (ASTIA), Arlington Hall Station, Arlington 12, Virginia: (1) Mankowich, A.M., *CCL Report No. 137*, "Influence of the HLB of a Nonionic Additive on the Detergency of Alkaline Cleaners Containing an Anionic Surfactant," January 10, 1963. (2) Mankowich, A.M., *CCL Report No. 163*, "Detergency-Micellar Relationships of an Anionic-Nonionic Surfactant Mixture," May 22, 1964.

The first report shows the effect of the HLB of the nonionic additive on detergency of medium pH alkaline cleaning solutions (ca. pH 12) containing anionic surfac-

tants such as sodium dodecyl sulphate, alkyl (straight chain) aryl sulphonate or sodium oleate. The nonionics were ethylene oxide condensates of nonylphenol and *t*-octylphenol. Synergism was demonstrated with some combinations.

The second report was a light scattering investigation of the micellar characteristics and detergent properties of anionic-nonionic surfactant mixtures in aqueous alkaline cleaning solutions of ca. pH 12. The detergency was found to be related to increasing charge on, and the number of anionic monomers in, the mixed micelle, as well as to a reduction in micellar dissociation.

A.M. MANKOWICH  
75 E. Ellendale Street  
Bel Air, Maryland 21014

[Received October 13, 1972]