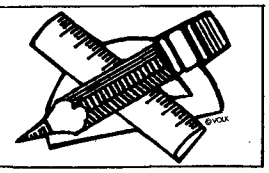
SD&C Abstracts



EDITOR: S. KORITALA • ABSTRACTORS: J.C. Harris, M.G. Kokatnur, F.A. Kummerow, G. List, B. Matijasevic, K.D. Mukherjee, D.B.S. Min, R.A. Reiners, and P.Y. Vigneron

DEVELOPMENT OF WATER-IN-OIL EMULSIFIERS AND THEIR APPLICATION TO COSMETIC EMULSIONS. J.P. McCarthy, S.J. Labruto, L.R. Mores and M.L. Schlossman (Malmstrom Chemicals, Every Industries, Inc. Linden, N.J.). *J. Soc. Cosmet. Chem.*, 28(12), 733–40 (1977). While much is known in the literature of oil-in-water emulsifiers, little has appeared concerning emulsifiers for stabilizing water-in-oil systems. Polyglycerol esters having lipophilic surface activity derived chiefly from isostearic and oleic acids were prepared and characterized. A chemical description of these surfactants and other isostearic surfactants are reviewed. Their physical and chemical properties are assessed as water-in-oil emulsifiers. Applications for preparing stable aesthetic functional w/o cosmetic emulsions are demonstrated.

IRRITANCY POTENTIAL OF COSMETIC INGREDIENTS. W. Kastner (Henkel & Co., Dusseldorf). *J. Soc. Cosmet. Chem.* 28(12), 741–54 (1977). The topical irritancy potential of fatty or fat-derived cosmetic ingredients on human skin in 24-hour patch tests was compared with that in various animal species. Different species exhibited widely varying reactivity under identical test conditions. The degree of irritation decreased in the order rabbit, guinea pig, hairless mouse and man. These data support the conclusion that the rabbit or guinea pig are not useful for skin irritancy studies. Data on hairless mice are more likely to permit prediction of human responses. Skin tolerance to raw materials or finished preparations—as determined on animals—cannot be related directly to human experience unless it has been established that human skin reacts similarly to animal skin. Consequently, topical studies of cosmetic components on human subjects should be included in the test program.

A QUANTITATIVE HUMAN PATCH TESTING PROCEDURE FOR LOW LEVEL SKIN IRRITANTS. K.J. Smiles and M.E. Pollack (Carter-Wallace, Inc. Cranbury, N.J.). *J. Soc. Cosmet. Chem.* 28(12). 755–64 (1977). A week-long repeated insult occluded patch test methodology is presented along with an analysis procedure based on relative slopes of irritation development. This method allows for quantitative comparison of the primary irritation potential of low level irritants, culminating in statistical statement concerning the differences among samples. The use of the method to determine differences between commercial shaving creams, among various perfumes for a shaving cream formula, and among various roll-on antiperspirants is presented, as well as the identification and solution of an apparent irritancy problem associated with an anti-perspirant formula intended for pump spray delivery.

MICELLAR MOLECULAR WEIGHTS AND HYDRATION OF ETHOXYLATED ANIONIC AND CATIONIC SURFACTANTS. B.W. Barry and R. Wilson (Portsmouth Polytech., England). *Colloid Polym. Sci.* 256(1), 44–51 (1978). Micellar molecular weights in water obtained from light scattering and corrected for charge effects, increased with increase in hydrocarbon chain length but decreased with increase in ethoxy group number. Micellar size of the ethoxylated surfactants was smaller than usual for paraffin chain salts. Micellar weights decreased 18% as the temperature increased from 25 to 45 C. Addition of 0.1 M. electrolyts increased micellar weight four fold. Analysis of the hydrodynamic data showed the ethoxylated micelles were hydrated with two molecules of water per ethoxy group. The hydrocarbon chain had little effect on hydration.

THE EFFECT ON WOOL KERATIN BY CERTAIN ADDITION AGENTS IN DETERGENTS. A. Tsanaka-Plivouri and A. Vassiladis (Univ. of Athens, Greece). *Colloid Polym. Sci.* 256(1), 22-30 (1978). The influence on wool of condensed polyphosphates contained in washing preparations was investigated. Deterioration of wool increases with increase in pH, the temperature and the duration of treatment. Under certain conditions of treatment, however, there is no significant change. Ions contained in the solution are also important to change.

AQUEOUS FILMS ON SILICA IN THE PRESENCE OF CATIONIC SURFACTANTS. M.P. Aronson and H.M. Princen (Lever Bros. Co. Edgewater, N.J.). *Colloid Polym. Sci.* 256(2), 140–9 (1978). Considered is the influence of alkyltrimethylammonium bromides on the stability of aqueous films on polished fused silica. In particular, the thickness and stability of aqueous films of C_5, C_8, C_{10} and C_{16} trimethyl ammonium bromides were studied over a range of surfactant concentrations. Contact angles of the TAB solutions on silica were measured. Once the critical concentration of each surfactant was exceeded, uniform wetting films on silica could not be formed. The films ruptured immediately regardless of their initial diameter. In this regime, the contact angles, measured through the aqueous phase, increased with TAB concentration up to a maximum value which occurred near the cmc.

SELECTIVE LIQUID ADSORPTION AND STRUCTURAL PROPERTIES OF MONTMORILLONITE AND ITS HEXADECYLPYRIDINIUM DERIVATIVES. I. Dekany, F. Szanto and L.G. Nagy (Josef Attila Univ., Szeged, Hungary). *Colloid Polym. Sci.* 256(2), 150–60 (1978). An X-ray diffraction method was used to study the structures of montmorillonites, the surfaces of which were covered to a systematically increasing extent with hexadecylpyridinium (HDP) cations. It was found that depending on the degree of cover of the surface, the HDP cations form a mono- or bimolecular layer in the interlayer space. A detailed investigation was made of the selective sorption of binary mixtures on montmorillonite and on HDP-montmorillonites with different surface coverages. The adsorption excess isotherms were determined, as were the adsorption capacities from analysis of the isotherms, and also the equivalent specific surface areas.

LIQUID FILM SPREADING ON A VERTICAL SURFACE. S. Fabre, A.B. Ponter and W. Peier. *Tenside Deterg.* 15(1), 16–8 (1978). The spreading of a liquid film down a vertical surface flowing from a vertical orifice was investigated experimentally. Water, glycerol solutions and an oil were examined since these liquids exhibited a wide range of viscosity, surface tension and density. The solid surfaces were made of copper, stainless steel, nickel and gold plate of different roughness and three orifice shapes were studied. A useful dimensional plot is presented to predict liquid spreading but the results indicate that boundary layer theory is necessary to provide reliable predictions of film spreading behavior.

INVESTIGATIONS INTO DIFFUSION IN AQUEOUS DISPERSING AGENT SYSTEMS, USING THE PULSATION-DIFFUSION METHOD. PART I. DEPENDENCE OF DIFFUSION COEFFICIENTS OF WATER SOLUBLE POLYMERS ON CONCENTRATION. F. Wolf, P. Konig and M. Khine. *Tenside Deterg.* 15(1), 7–8 (1978). Demonstrated that the pulsation-diffusion method is suitable for determining diffusion coefficients of water soluble polymers. From the concentration dependence of the diffusion coefficients it is possible to arrive at a conclusion as regards the cmc and changes in the micelle structure in suitable systems.

RECIPROCAL EFFECTS OF NONIONIC SURFACTANTS WITH TYROTHRICIN. PART 3. LOCALIZATION OF THRYTHRICIN IN THE SURFACTANT MICELLE. E. Ullmann, K. Thoma and L. Patt (Univ. München). *Tenside Deterg.* 15(1), 9–13 (1978). The partition of tyrothricin between the micellar pseudophase and water in solutions of polyoxyethylene fatty acid esters and polyoxyethylene fatty alcohol ethers was determined to depend on the hydrophobic part as well as the hydrophilic part of the surfactants. According to these results and those of the surfactants influence on the UV spectrum of tyrocidine the antibiotic is supposed to be located between the hydrophilic and lipophilic regions of the micelles. According to the antibiotic's association properties there is assumed a combined association of the polyoxyethylene derivatives and tyrothricin. •