

Synthesis and Characterization of New Silicone-Based Surfactants



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Education

B.A., Fairleigh Dickinson University, 1975
 Research Technician, Allied Chemical Corp., 1975-76
 M.S., Cornell University, 1979
 Ph.D., Cornell University, 1982
 Post Doctoral Fellow, Northwestern University, 1982-1983

Areas of Expertise

Inorganic Chemistry, Polymer Chemistry,
 Cosmetic Chemistry

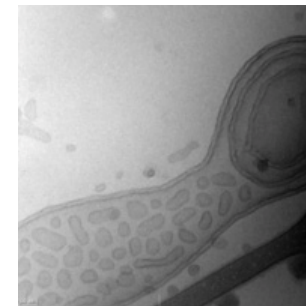
Grants and awards

Zanfel Corporation, 2005, \$100,000
 Zanfel Corporation, 2005-2005, \$150,000

Publications and Presentations

Textbook: Introductory Chemistry, 3rd ed., with Steven Russo, Benjamin Cummings Pub.

We have developed a class of water dispersible, intermediate HLB (hydrophilic-lipophilic balance) alkylsiloxane-dimethyl-siloxane-oxyalkylene copolymers whose stable dispersions in water consist of submicron micelles and multilamellar vesicles. The cryogenic-Transmission Electron Microscope (cryo-TEM) image below shows smaller vesicles within a larger multilamellar vesicle.



These surfactant/emulsifiers do not possess a cloud point, yet demonstrate cmc's (critical micelle concentrations) similar to surfactants that do. These materials are being studied as emulsifiers for cosmetic formulations, as foam stabilizing surfactants for polyurethane foams, and as water dispersible polyurethane mold-release agents. Our project involves organic and inorganic synthesis via standard laboratory and industrial (pressurized reactor) techniques, characterization via NMR, IR, UV, GPC, HPLC, Si-H determination, particle size determination via laser light scattering, cryogenic transmission electron microscopy, surface energy and viscosity determination, computational methods, and is done in collaboration with various university and industrial partners.