

## 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

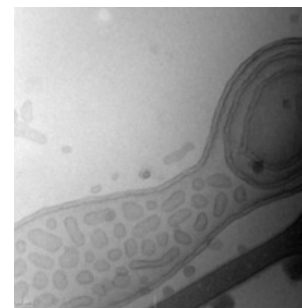
Zanfel Corporation, 2005, \$100,000

### Publications and Presentations

Patent Application: Water-Soluble Amino Acid Derived Anionic Surfactants for the Treatment of Poison Ivy and Other Forms of Allergic Contact Dermatitis

Textbook: Introductory Chemistry, 3<sup>rd</sup> 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.