332b Polymerization in Surfactant Solutions

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Closed spherical polymer shells can be synthesized via polymerization of monomers taken up in closed surfactant bilayers called vesicles, or by polymerization of the surfactants themselves. Typical vesicle dispersions are fomed by mechanically disrupting a lamellar phase, but vesicles form spontaneously in mixtures of cationic and anionic surfactant. Proper use of surfactant mixtures avoids syntheses of specialized surfactant molecules, and indeed the electrostatic interactions of anionic and cationic surfactants makes available a rich variety of microstructures. The unilamellar vesicles can be used as templates or molds for polymerization reactions, and the resulting products are characterized by Cryo-TEM and scattering experiments.