LIQUID CORE - POLYMER SHELL PARTICLES

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Core-shell particles (microcapsules), dispersed in water, with liquid cores and polymer shells of controlled thickness and morphology, are excellent candidates for the controlled release of "active" molecules, such as pharmaceuticals, agrochemicals, perfumes, flavors, dyes, inks, etc. Various methodologies have been reported for making such capsules. In this paper we will discuss a novel method for the preparation and characterization of a variety of different microcapsules, including ones with oil cores and others with aqueous cores, depending on the nature of the active material to be released. The general method used for their preparation is based on *interna*l phase separation of the polymer wall from the droplets of either an oil/water emulsion or a water/oil emulsion depending on the nature of the internal phase required. For the aqueous core particles, the external oil phase is replaced (after shell formation) by an aqueous phase. Control of the various interfacial tensions is critical in obtaining particles with a shell (rather than an "acorn" structure"). The size of the microcapsules, and the polymer wall thickness and permeability can be readily controlled using this method. Characterization of the microcapsules is mainly based on light scattering, optical microscopy and SEM (of the broken microcapsules).

Some data will be presented for release rates and amounts of model active materials, and how this is affected by changes in the various system parameters, such as the size of the liquid core, the polymer shell thickness, and the nature of the polymer shell.