

The Morphology of Polymer Colloid Particles Formed
by an Engulfment Process

A.B. Schofield[†], R.H. Ottewill[†] and J.A. Waters*

[†] School of Chemistry, University of Bristol, U.K.

* ICI Paints, Slough, U.K.

A novel process of forming polymer colloid particles with a "currant-bun" morphology is by the engulfment of one type of particle into another. An important criterion for the success of this process is that the interfacial tensions of each particle with the medium and of the particles with each other should be controlled. In order to illustrate this, a brief survey of the theoretical concepts will be given leading to an equation which shows the optimum conditions under which particle engulfment can occur. In order to test these concepts a number of experiments have been carried out. The system examined used small polystyrene particles and larger poly-butylmethacrylate particles. The small particles were firstly induced to attach to the larger particles and then the whole system was raised above the glass transition temperature of poly-butylmethacrylate. This allowed the particles of higher glass transition temperature to be engulfed. The particle morphology was examined by the use of electron microscopy.