



Controlled Particle Size of Miniemulsion Polymerization in Presence of Different Hydrophobic Agents

Saber A. Ibrahim*, Omar R. Soliman

Packaging Materials Department, National Research Centre, 12622, Dokki, Cairo, Egypt.

Abstract : Polystyrene (PS) within a size range of 82–132 nm was successfully synthesized by miniemulsion polymerization, where the particle size responded to the nature and amount of the added hydrophobes. Three different types of hydrophobes (hexadecane, polycarbonate and Jaffamine M-600) were chosen in this study and each resulted in a different emulsification behavior than PS alone. The hydrophobic agents were mainly chosen due to their limited water solubility. The chosen sonication time for emulsion and hydrophobes were sufficient to mini-emulsify droplets and to polymerize them to PS. Scanning electron and transmission electron microscopy were used to study the morphology of the produced PSs. Thermogravimetric analysis revealed polymer stability was improved as a result of incorporation of hexadecane, polycarbonate and Jaffamine M-600 as hydrophobes. Unimodal particles of PS were prepared as resins, which would be convenient products for many industrials especially as packaging materials.

Keywords: nanoparticle size; miniemulsion; hydrophobe agent.

Saber A. Ibrahim *et al* /International Journal of ChemTech Research, 2016,9(6),pp 208-214.
