

Preparation of Micron-size PS/PDVB Particles for Anisotropic Conductive Polymer Balls

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Monodispersed highly crosslinked polymer particles in micron-size were prepared for application of anisotropic conductive polymeric balls. The PS/PDVB composite polymer particles were synthesized by dynamic swelling of DVB on the PS seed particles prepared by dispersion polymerization then further polymerization of DVB swolled PS particles. The compressional stress-strain behavior of individual polymer particles was evaluated using micro-compressional testing device. Two different test modes including a compression test and a load-unload test, representing one of the most important properties for polymer ball for ACF application, were performed in this experiment. Monodispersed PS/PDVB(PS/PDVB=1/20) particles with 5.4 micron in diameter showed compressional strength of 80 kg./mm² at 46% strain during compression test. It also showed compressional recovery ratio of 47% for load-unload test. We also evaluated the performance of composite particles with different types of crosslinkable monomers including EGDMA and TEGDMA. Among DVB, EGDMA, and TEGDMA, EGDMA showed better compressional strength and elastic recovery behavior.