POLY (METHYL METHACRYLATE)/GRAPHENE MICROPARTICLES HAVING A CORE/SHELL STRUCTURE PREPARED WITH CARBOXYLATED GRAPHENE AS A PICKERING STABILIZER

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Abstract— Two kinds of carboxylated thermally reduced graphenes (C-TRGs) having different lateral sizes are examined as a Pickering stabilizer in the suspension polymerization of methyl methacrylate. The size and the shape of the prepared composite particles are irregular due to agglomeration, more evidently when the larger C-TRG is used. In addition, C-TRG is distributed not only on the surface but also inside the composite particles. It indicates that the C-TRG alone is not a stable Pickering agent. However, a very small dosage of acrylic acid remedies all these issues, because acrylic acid interacts with C-TRG and synergizes the stabilizing effect. The compression molded composite of the core/shell poly(methyl methacrylate)/C-TRG particles exhibits a very low percolation threshold of electrical conductivity of 0.03 vol%. It demonstrates that the C-TRG shells of the composite particles effectively form a segregated conductive network throughout the composite.