OP-11-441

Tuesday, May 10, 2011, 06:00-06:20 pm
Room: Karam 2

MICROSTRUCTURAL INVESTIGATION OF ELECTRICALLY CONDUCTIVE POLYMER COMPOSITE FOAMS CONTAINING CARBON BLACK, GRAPHITE AND EXPANDED GRAPHITE

G. Nikravan[a], G.H. Motlagh[a]*

[a] *Department of Chemical Engineering, University of Tehran, Tehran, Iran and* [b] *Department of Chemical Engineering, University of Tehran, Tehran, Iran*

**Corresponding author: ghmotlagh@ut.ac.ir*

The application of electrically conductive polymer composites is increasingly growing in various areas due to their excellent chemical and corrosion resistance, low weight, smart functional performances and ease of shaping into small and complex geometries. It has been previously observed that foam injection molding of conductive polymeric composites containing nano-size carbon black particles, surprisingly increases their electrical conductivity, while lowers the part weight. These advantages of foaming lead to higher interest and capability for using conductive polymer composites. The increase in electrical conductivity via foaming was related to the effect of foam cells on the state of distribution of aggregates to a more compact structure for agglomerates and/or a more phase-segregated composite. To investigate the effect of processing method, injection and compression molding were used to make and characterize the samples of carbon black nanocomposites. Furthermore, composites of graphite and expanded graphite, prepared by compression molding, were compared from the aspect of morphology and electrical conductivity. The electrical percolation threshold was much lower for expanded graphite composites compared to that of graphite composites. Finally the effect of foaming on the electrical conductivity of graphite and expanded graphite composites was studied to see whether foaming has similar effect to that for carbon black composites.