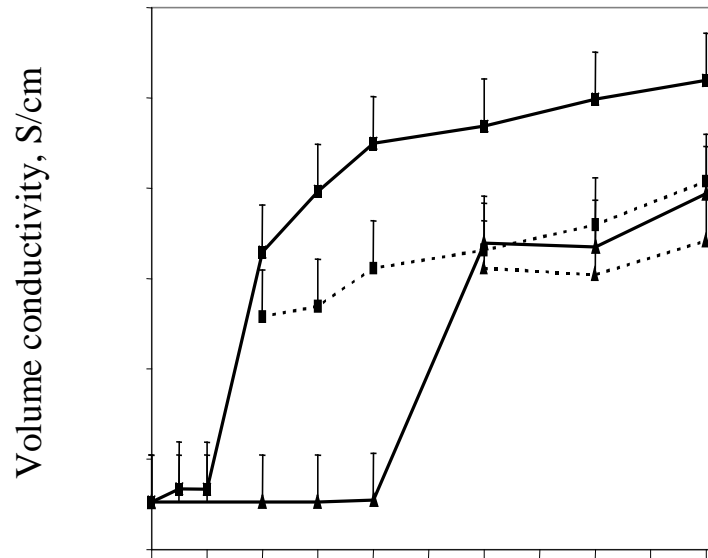


NANOFILLER DISPERSION BY CHAOTIC MIXING

Our study shows that nanofillers such as layered silicate clay, carbon nanofibers, and silicon carbide disperse very well in polymeric matrices when mixed in chaotic mixers. Some examples are presented here. In addition to dispersion, layered silicate clay and carbon nanofibers have been shown to align along the flow direction. The chaotic mixing conditions also cause much less damage to high aspect ratio nanofillers such as carbon nanofibers. In this manner, electrically conductive composites of poly(methyl methacrylate) and carbon nanofibers (CNF) are prepared, which show percolation threshold of approximately 2 wt.% CNF compared to 6 wt.% for materials prepared in an internal mixer under comparable conditions of mean shear rate. Nanofibers are pulled out of the bundles and oriented along the flow directions to produce electrically conductive networks. The same was observed in the mixing of treated carbon nanofibers with polyurethanes.

Publications:

1. Jimenez, G., Jana, S.C., 2007 Polymer composites of oxidized carbon nanofibers prepared by chaotic mixing. *Carbon*



Volume electrical conductivity of PMMA/CNF composites. Results from materials mixed in chaotic mixer and Brabender Plasticorder are identified. (38, 983-993.)