55e Connecting the Wetting and Rheological Behaviors of Pdms-Grafted Nanospheres in Pdms Melts

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Engineered nanocomposites are often formulated by grafting polymer brushes to the surfaces of colloids to optimally disperse them into viscous polymer matrices. In spite of the ubiquity of these filled materials, the essential mechanisms in producing an optimal dispersion have not been well quantified. To this end, rheological and light scattering measurements are made to connect the static wetting and dynamic flow properties of polydimethylsiloxane (PDMS)-grafted silica nanospheres in PDMS melts. By controlling the brush grafting density and the matrix chain length of these model systems, results indicate that the wetting and the flow behaviors can be quantifiably linked. Overall, these studies represent new ways of quantifying the factors that control the dispersion of polymer-grafted nanoparticles in viscous melts.