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Glass transition behavior of polystyrene/silica nanocomposites.¹ YUPING XIE, SUDEEPTO SEN, SANAT KUMAR, Rensselaer Polytechnic Institute, AMITABH BANSAL, GE, GE COLLABORATION — The change in thermomechanical properties of nano-filled polymers is of considerable scientific and technological interest. The interaction between the nanofillers and the matrix polymer controls the nanocomposite properties. We will present the results from recent and ongoing DSC experiments on polystyrene/silica nanocomposites. Polystyrene of different molecular weights (and from different sources) and silica nanoparticles 10-15 nm in diameter (both as received from Nissan and surface modified by grafted or physisorbed polystyrene) are being used to process the nanocomposites. We are studying trends in the glass transition behavior by changing the matrix molecular weights and the silica weight fractions. Recent data indicate that the glass transition temperature can both decrease and increase depending on the polymer-nanofiller combination as well as the thermal treatment of the nanocomposites prior to the DSC runs.

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