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Interfacial Energy and Glass Temperature of Polymers Confined to Nanoporous Alumina GEORGE FLOUDAS, University of Ioannina and MPI-P, STELIOS ALEXANDRIS, University of Ioannina, YANG YAO, MPI-P, Mainz, PERIKLIS PAPADOPOULOS, University of Ioannina, MARTIN STEINHART, Universitt Osnabrck, HANS-JUERGEN BUTT, MPI-P, Mainz — We report on the effect of interfacial energy on the glass temperature, T_g, of several amorphous polymers with various glass temperatures and polymer/substrate interactions confined within self-ordered nanoporous alumina (AAO). The polymers studied include: poly(phenyl methyl siloxane) (PMPS), poly(vinyl acetate) (PVAc), 1,4 polybutadiene (PB), oligostyrene (PS) and poly(dimethyl siloxane) (PDMS). The segmental dynamics and associated T_g's are studied by means of dielectric spectroscopy. The interfacial energy for the polymer/substrate interface, γ_{SL}, is calculated with Young's equation whereas the AAO membrane surface energy is obtained by measuring contact angles for several reference liquids. We find that interfacial energy play a significant role on the segmental dynamics of polymers under confinement within AAO. There is a trend for a *decreasing* glass temperature relative to the bulk with *increasing* interfacial energy. PDMS exhibits the highest interfacial energy and the highest reduction in glass temperature within AAO. Other effects that may also contribute to changes in T_g are discussed.

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