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Crosslinked Matrix-free Nanocomposites BENJAMIN DACH[1], HERNAN RENGIFO[2], NICHOLAS TURRO[3], JEFFREY KOBERSTEIN[4], Columbia University — Matrix-free polymer-silica nanocomposites are formed by crosslinking polymer coated nanoparticles via the 'click' reaction. The 'click' reaction is also known as Hüisgen 1, 3-dipolar cycloaddition of terminal alkyne and azide functional groups to give 1, 2, 3-triazoles. Silica nanoparticles are functionalized with alkyne and azide moieties. Heterobifunctional α,ω-trimethylsilane-alkyne,azide-poly(styrene) (TMS-PS-N_3) and α,ω-trimethylsilane-alkyne,azide–poly(*tert*-butyl acrylate) (TMS-PtBA-N_3) are then covalently bound to the surfaces of the nanoparticles via the 'click' reaction. The bare and modified nanoparticles are analyzed by diffuse reflectance infrared Fourier transform spectroscopy (DRIFTS). The thermal, morphological, and mechanical properties of the systems are investigated by thermogravimetric analysis (TGA), transmission electron microscopy (TEM), and dynamic rheology, respectively. .

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