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Tunable Wetting of Polymer Nanocomposite Films MARLA MCCONNELL, SHU YANG, RUSSELL COMPOSTO, University of Pennsylvania — Surfaces with controlled wettability are of growing technological importance. In this study, nanoparticles (NPs) with tunable spacing were assembled on poly(styrene-*ran*-acrylic acid), S-*r*-AA, films to manipulate the composite films' wetting properties. Amine-modified silica NPs (15-200 nm) were covalently grafted to the AA moieties on the surface of the S-*r*-AA films, in which the S phase imparts mechanical stability and the AA domains swell, increasing the roughness and surface area. By controlling surface roughness and reaction time, NP coverage ranged from 1%-70%. These films displayed NP-coverage-dependent water contact angles between 60°and 120°. The enhanced hydrophobicity is attributed to capillary climbing of S-*r*-AA chains to cover the previously hydrophilic NP surface. Upon increasing NP diameter, the contact angle was found to increase at a fixed total coverage. This increase in attributed to the increase in effective surface area with increasing particle size. This system is utilized as a platform to create Janus particles with unique optical properties and templates for investigating molecular motors.

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