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Microphase-Separated Structures of Gold Nanoparticle Grafted with Two Immiscible Polymers DAISUKE KAWAGUCHI, TATSUHIRO NAKANO, YUSHU MATSUSHITA, Department of Applied Chemistry, Nagoya University — It is important to control structures of organic-inorganic hybrid materials to make functional devices. If gold-nanoparticle (AuNP) grafted with two immiscible polymers can self-assemble into microphase-separated structures, it can be expected that AuNP arranges on their own microphase-separated interface in nanometer scale. In this study, we prepared AuNP grafted with polyisoprene (PI) and polystyrene (PS) which were immiscible polymers and investigated their microphase-separated structures by small-angle X-ray scattering (SAXS) and transmission electron microscopy (TEM). The AuNP complexes form various microphase-separated structures such as lamellar, cylindrical and spherical structures with changing polymeric composition. The TEM image and SAXS profile for the AuNP complexes for the symmetric composition shows that PS and PI form lamellar structures and the AuNPs are forced into the PS/PI interface.

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