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Precisely Size-Tunable Magnetic/Plasmonic Core/Shell Nanoparticles with Controlled Optical Properties. ZHIQUN LIN, BEIBEI JIANG, XINCHANG PANG, BO LI, Georgia Institute of Technology — Star-like amphiphilic triblock copolymers were rationally designed and synthesized by combining two sequential atom-transfer radical polymerization reactions with a click reaction. Subsequently, a family of uniform magnetic/plasmonic core/shell nanoparticles was crafted by capitalizing on these triblock copolymers as nanoreactors. The diameter of the magnetic core and the thickness of the plasmonic shell could be independently and accurately controlled by varying the molecular weights (i.e., the chain lengths) of the inner and intermediate blocks of the star-like triblock copolymers, respectively. The surface plasmonic absorption of core/shell nanoparticles with different core diameters and shell thicknesses was systematically studied and theoretically modeled. This robust strategy provides easy access to a large variety of multifunctional nanoparticles with large lattice mismatches for use in optics, optoelectronics, catalysis, or bioimaging.

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