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Self-assembly of metal–polymer analogues of amphiphilic triblock copolymers ZHIHONG NIE, DANIELE FAVA, EUGENIA KUMACHEVA, SHAN ZOU, GILBERT WALKER, Department of Chemistry, University of Toronto, Canada, MICHAEL RUBINSTEIN, Department of Chemistry, University of North Carolina, USA, EUGENIA KUMACHEVA TEAM, SHAN ZOU, GILBERT C. WALKER COLLABORATION, MICHAEL RUBINSTEIN COLLABORATION — We proposed a block copolymer approach to the self-assembly of inorganic nanrods terminated with polymer molecules at both ends. We organized metal nanorods in structures with varying geometries by using a striking analogy between amphiphilic ABA triblock copolymers and the hydrophilic nanorods tetheredwith hydrophobic polymer chains at both ends. The self-assembly was tunable and reversible and it was achieved solely by changing the solvent quality for the constituent blocks. The distance between adjacent nanorods along chains can be tuned by varying the composition of mixture solvents or the molecular weight of polymer blocks, which allows us precisely control the plasmonic band of self-assembled structures. A systematic study of the self-assembly as a function of solvent composition and the molecular weight of the polymer blocks allowed us to construct a diagram that maps the assembled structures. This approach provides a new route to the organization of anisotropic nanoparticles by using the strategies that are established for the self-assembly of block copolymers.

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