

Synthesis of nanospheres decorated with Nickel nanoparticles from the self-assembly of biomimetic bolaamphiphile molecules

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Novel biomimetic bolaamphiphile molecule was synthesized to have strong affinity to nickel. By introducing additional imidazole groups at the both ends of biomimetic molecule, nickel binding property was endowed. Using the self-assembled structure of this molecules, nanospheres decorated with nickel nanoparticles were prepared. The biomimetic molecule with nickel affinity was prepared by conjugating histamine with bis(N- α -amidoglycylglycine)-1,7-heptane dicarboxylate molecules. After preparation, nickel nanoparticle-decorated self-assembled nanospheres were obtained by mixing the biomimetic bolaamphiphile molecule with nickel precursor. Conjugation of histamine was confirmed from the spectroscopic analysis with NMR and IR, and the prepared nanospheres were observed with TEM. Newly introduced imidazole may interact with nickel ion as well as influence on the self-assembled structure. The detailed mechanism of the self-assembly is left for the further study. The outcome of this work may be used for the preparation of novel metal-organic hybrid materials that can be used wide engineering applications including medical devices.