

### Preparation of polymeric microrods decorated with magnetic nanoparticles

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In this study, magnetic nanoparticle decorated polymeric microrods were prepared from an amphiphilic molecule that contains both hydrophilic amide bond and hydrophobic pyrrole rings. This novel amphiphilic molecule was synthesized from 1-(2-carboxyethyl) pyrrole and adipic acid dihydrazide through the bioconjugational technique. This newly synthesized molecule formed straight rod in micrometer scale through the evaporation-induced self-assembly (EISA). Magnetic nanoparticle was synthesized from iron chloride precursors by hydrothermal decomposition. These magnetic nanoparticles had hydrophobicity and dissolved in organic solvent. By simple mixing of nanoparticle suspension with amphiphilic molecule and subsequent EISA the magnetic nanoparticle decorated polymeric nanorods were obtained. The microrods were investigated using NMR spectroscopy, SEM, and TEM to observe the shapes of rod and magnetic nanoparticle. Amide bonds and pyrrole rings are believed to contribute to the EISA via strong hydrogen bonds of amide bonds and pi-pi stacking interaction of pyrrole rings. This nanoparticle-microrod composite is expected to be used diverse applications such as preparation of the magnetic polymer thin film.