

Polymeric nanoparticles as bimodal imaging contrast agents

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This work concerns the preparation and characterization of methylmethacrylate-based (MMA) polymeric nanoparticles (PNPs) via surfactant-free emulsion radical polymerization. Acrylic acid (AA) and N,N-dimethylacrylamide (DMAA) were used as comonomers to obtain p(MMA-co-AA) and p(MMA-co-DMAA) NPs. PNPs in the 200-500 nm size range were characterized by FTIR, ^1H -NMR, DLS, ζ -potential, and XPS spectroscopy. Morphology at solid-state was observed via AFM, SEM, TEM. Then, PNPs were loaded with Y^{3+} ions due to the presence of chelating sites, *e.g.*, amine or amide sites. PNPs as imaging probes were obtained by physical encapsulation of FITC isomer I into the NPs core. The systems were tested *in vitro* for cytocompatibility evaluation. To investigate the fate of the PNPs before and after treatment, *in situ* TEM observations were performed and the bright fluorescence of FITC-encapsulated NPs was studied via fluorescence microscopy.