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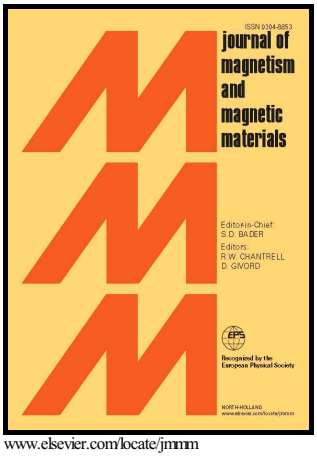

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Surface functionalization of dopamine coated iron oxide nanoparticles for various surface functionalities

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Abstract

We present effective conjugation of four small molecules (glutathione, cysteine, lysine, and *Tris*(hydroxymethyl)aminomethane) onto dopamine-coated iron oxide nanoparticles. Conjugation of these molecules could improve the surface functionality of nanoparticles for more neutral surface charge at physiological pH and potentially reduce non-specific adsorption of proteins to nanoparticles surfaces. The success of conjugation was evaluated with dynamic light scattering by measuring the surface charge changes and Fourier transform infrared spectroscopy for surface chemistry analysis. The stability of dopamine-coated nanoparticles and the ability of conjugated nanoparticles to reduce the formation of protein corona were evaluated by measuring the size and charge of the nanoparticles in biological medium. This facile conjugation method opens up possibilities for attaching various surface functionalities onto iron oxide nanoparticle surfaces for biomedical applications.

Keywords: Magnetic nanoparticles; Conjugation; Biomedical applications; Zwitterionic surface chemistries

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