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## Polyamidoamine (PAMAM) dendrimer coated iron oxide nanoparticles for biomedical applications

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Dendrimers are nano-sized, radially symmetric molecules with well-defined, homogeneous, and monodisperse structure with symmetric core, an inner shell, and an outer shell. They generate polydisperse products of different molecular weights. Polyamidoamine (PAMAM) dendrimer has been coated to Fe<sub>3</sub>O<sub>4</sub> core to prepare PAMAM-Fe<sub>3</sub>O<sub>4</sub> core-shell nanostructures of different hydrodynamic sizes. Magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles were prepared by chemical co-precipitation method using microwave synthesizer which enhanced the rate of the synthesis. The synthesized nanoparticles were modified with 3-aminopropyltrimethoxysilane (APTES) for further coating with the dendrimer. This improves magnetic properties and size distribution (reduction of agglomeration). Dendrimers were synthesized using convergent method of synthesis. APTES-modified magnetite NPs were coated with PAMAM dendrimer through Michael addition reaction. The functionalized magnetite nanoparticles were characterized by suitable methods. The aqueous solubility of a known non steroidal anti-inflammatory drug (NSAID), Naproxen was measured in the presence of dendrimer functionalized Fe NPs in distilled water and found to be proportional to dendrimer concentration at constant pH condition. This is due to electrostatic interaction between the carboxyl group of the naproxen molecule and groups of the dendrimer molecule. Their characteristics such as polyvalency, self-assembling, electrostatic interactions, chemical stability, low cytotoxicity, and solubility make these PAMAM-Fe<sub>3</sub>O<sub>4</sub> a good choice in the medical field in drug delivery, imaging, photodynamic therapy etc.

### Biography

Niranjan Sanzgiri is currently pursuing his PhD in the Department of Chemistry, Ramnarain Ruia College. His research interests are Nanotechnology and Synthetic Organic Chemistry.

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