

## Ionothermal Synthesis of Iron Oxohydroxide Nanoparticles and Nanorods for Water Treatment

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Nanomaterials synthesized by green chemistry are of prime importance in the field of nanoscience and nanotechnology, owing to not only their novel characteristics related to shape-specific and quantum-size effects but also their utility for reducing impacts on human health and the environment. There have been developed a variety of environmentally friendly solution methodologies without sacrificing well-defined structure, unique properties, monodispersity, sample quality, etc. Of these, the ionothermal process utilizes the templating and cosolvent functions of ionic liquids (ILs), which provide unique properties such as non-volatility, thermal stability, tailorable solubility, etc. Herein, we report green-solution synthesis of water-dispersible iron oxohydroxide nanoparticles and nanorods via ionothermal process by using hydrophilic ILs for an application into photocatalysis. Water soluble IL, i.e. 1-butyl-3-methylimidazolium chloride (C4MimCl), plays a role of functionalizers for the dispersion of as-synthesized materials into water as well as template and cosolvent agents in the environmentally acceptable design and fabrication of iron oxohydroxide nanoparticles and nanorods.