

SUPERPARAMAGNETIC ADSORBENT BASED ON PHOSPHONATE GRAFTED MESOPOROUS CARBON FOR SEQUESTRATION OF URANIUM FROM ENVIRONMENTAL WATERS

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Ordered mesoporous carbon functionalized with phosphonate groups and magnetic nanoparticles has been successfully synthesized by modifying the mesoporous carbon with Nitrilotri(methylphosphonic acid) (NTMP). Through the in-situ reduction of Fe^{3+} , magnetic nanoparticles were successfully incorporated into the mesopores, resulting in the multifunctional mesoporous carbon, P-Fe-CMK-3. The obtained composite carbon material possesses mesoporous structure, high Brunauer-Emmett-Teller (BET) surface area, large pore volume, phosphonate ligand on the surface, and excellent magnetic property. The functionalized hybrid inorganic-organic adsorbent also showed high efficiency for the removal of aqueous uranium from groundwater, seawater and radioactive wastewater.

