Magnetic, structural and adsorption properties for methylene blue of PAA/MnFe2O4 nanocomposite

WEI WANG, ZUI DING, School of Science, Beijing University of Chemical Technology, Beijing 100029, China. J. PING LIU, Department of Physics, University of Texas at Arlington, Arlington, TX 76019, USA — PAA/MnFe2O4 nanocomposite was fabricated by a hydrothermal procedure and ultrasonic wave-assisted method. The morphology of the synthesized MnFe2O4 ferrite nanocrystals is the exclusive octahedral structure. The saturation magnetization Ms of as-synthesized nanoparticles reached 74.6emu/g. FTIR spectrum confirms the coating of PAA on the surface of MnFe2O4 ferrite nanoparticles. Here, the PAA coating does not lead to a deterioration in magnetic performance. Moreover, the PAA/MnFe2O4 nanocomposites were applied to remove Methylene Blue (MB) from wastewater. Compared with the nanoparticles without coating, the PAA coating significantly enhanced the adsorption capacity of MB onto MnFe2O4 magnetic nanoparticles, where a rapid and efficient removal of MB was observed. The research suggests that as-synthesized PAA/MnFe2O4 nanocomposites have promising and potential applications in water treatment for removal of dyes.