Ultrasound assisted green synthesis of iron oxide nanoparticles using fenugreek seed extract and their antioxidant activity

Deshmukh Aarti Rajendra, 김범수†
충북대학교
(bskim@chungbuk.ac.kr†)

This study reports a facile and ecofriendly approach for the ultrasound assisted green synthesis of iron oxide nanoparticles and their enhanced antioxidant activity. The fenugreek seed extract acts as capping and stabilizing agent in the synthesis of iron oxide nanoparticles. The transmission electron microscopy results showed that nanoparticles synthesized by ultrasonication have a smaller size (~20 nm) as compared to the nanoparticles fabricated by magnetic stirring (~40 nm). The color change of the solution from pale yellow to brown suggested the formation of iron oxide nanoparticles which was confirmed by the presence of an absorbance peak at 309 nm. The results of powder X-ray diffraction and energy dispersive X-ray spectroscopy confirmed the crystallinity and elements present in nanoparticles synthesized using fenugreek seed extract. The ultrasound assisted nanoparticles showed higher stability and antioxidant activity compared with the nanoparticles fabricated by magnetic stirring.