

Enhancement of magnetic resonance contrast effect using ionic magnetic clusters

서성백^{1,2}, 양재문^{1,2}, 이통일³, 정찬화⁴, 서진석^{5,2}, 허용민^{5,2}, 함승주^{1,2,*}

¹연세대학교 화학공학과;

²연세대학교 나노메디컬 국가핵심연구센터; ³ATGen;

⁴성균관대학교 화학공학과;

⁵연세대학교 의과대학 진단방사선과

(haam@yonsei.ac.kr*)

Precise diagnosis by magnetic resonance imaging (MRI) requires sensitive magnetic resonance probes to detect low concentrations of magnetic substances. Ionic magnetic clusters (IMCs) as versatile magnetic probes were successfully synthesized for enhancing the magnetic resonance (MR) contrast effect as well as ensuring high water solubility. IMCs with various sizes were prepared by assembly of MNCs using cationic cetyltrimethylammonium bromide (CTAB) and anionic sodium dodecyl sulfate (SDS). To synthesize IMCs in the aqueous phase, magnetic nanocrystals in an organic solvent were assembled with CTAB and SDS using the nanoemulsion method, to fabricate cationic magnetic clusters (CMCs) and anionic magnetic clusters (AMCs), respectively. IMCs demonstrated ultrasensitivity by MR imaging and sufficient magnetic mobility under an external magnetic field.