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CHARACTERIZATION OF RADIOACTIVE MAGNETIC FLUIDS $Cu_XFe_{1-X}OFe_2O_3$ FOR BIOMEDICAL APPLICATIONS

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The development of drug delivery system aimed at targeting to a specific site has been an exciting area of intensive research. Despite successful application of radiation therapy in cancer treatment, the adverse effects limit its wide utility [1].

In order to prevent untoward effect of radiation therapy, we attempted to constitute the magnetic fluids without effect on abnormal cell. Although previous study have successfully synthesized $Cu_xFe_{1-x}OFe_2O_3$ magnetic fluid coated with decanoic acid and nonanoic acid as a 1st and 2nd surfactants, the presence of nonanoic acid resulted in lower magnetization and toxicity in last step. Therefore, it is necessary to prepare the magnetic fluid with higher magnetic properties and improved biocompatibility [2,3].

Recently, a variety of surfactants such as citric acid, alginic acid, and polyethylene glycol (PEG), which are used as 2nd coating material, have been documented to exhibit the increased biocompatibility [4]. In this study, $Cu_xFe_{1-x}OFe_2O_3$ magnetic fluids coated with various surfactants was prepared and investigated their properties.

The magnetic particle was synthesized by coprecipitation of Fe^{2+}, Fe^{3+} and Cu^{2+} in the presence of NH_4OH at 80°C and then coated with decanoic acid. The decanoic acid-coated magnetic particles was cooled to room temperature and successively washed with acetone (10 ml) and water (90ml). After that, the resulting precipitate was coated with citric acid, alginic acid, or PEG

at 60°C. Finally, it was found the alginic acid-coated magnetic particles exhibited a highest saturation magnetization as a 34.6 emu/g

References

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