

課題番号 : F-21-NU-0049
利用形態 : 機器利用
利用課題名(日本語) :
Program Title (English) : Magnetic Measurement of the Chitosan-decorated Iron Oxide
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キーワード/Keyword : 機械計測(Mechanical measurement), 磁気測定(magnetic measurement), 超常磁性(superparamagnetic property)

1. 概要(Summary)

The chitosan-decorated iron oxide used for the magnetic drug delivery system was synthesized to cure the cancer disease. The superparamagnetic nanoparticles which are safe in vivo are wanted.^[1] In this work, chitosan-decorated iron oxide was magnetically measured using Nagoya University's vibrating sample magnetometer.

2. 実験(Experimental)

【利用した主な装置(Name of Used Equipment)】

磁気特性評価システム群 (Vibrating Sample Magnetometer, VSM)

【実験方法(Method)】

The 5φ Ni 4.539 was used first for calibrating the VSM equipment setting the time constant 100ms, H sweep speed 5 min/loop, M axis expansion magnification 1, M axis full scale 10 emu, H axis expansion magnification 1, and H axis full scale 15000 Oe, when measuring the magnetic properties of powder samples. And then, the special empty holder for powder samples was attached to the VSM and measured as a background each time before the formal testification of each powder sample. The parameter M axis full scale in this every pair of the measurements were varied to different suitable values from different samples but controlled to be same. Besides, the experiments were conducted at room temperature and the weights of the powder samples were recorded after the measurements.

3. 結果と考察(Results and Discussion)

The synthesized chitosan-decorated iron oxide investigated by the VSM equipment shows the superparamagnetic property which indicates that it is promising to be a candidate for drug delivery. The saturation magnetization values (M_s) of sample 6 (chitosan-decorated) and sample 7 (without chitosan-decorated) were found to be 21.71 and 4.31 emu/g respectively (Fig. 1). In the future, the amount of the coating material chitosan will be reduced relatively for obtaining a higher saturation magnetization value of the product.

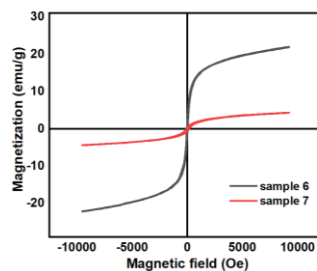


Fig. 1 Magnetization curves of synthesized chitosan-decorated iron oxide.

4. その他・特記事項(Others)

・参考文献:[1]Farnaz Assa et al., Chitosan magnetic nanoparticles for drug delivery systems, (2016)

5. 論文・学会発表(Publication/Presentation)

None.

6. 関連特許(Patent)

None.