

Iron oxide magnetic nanoparticles: A short review

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ABSTRACT

Magnetic nanoparticles have been enjoying great importance and wide scale applications during the last two decades due to their specific characteristics and applications. Iron oxide magnetic nanoparticles with appropriate surface chemistry have been implied in numerous applications such as biomedicine and cancer therapy, catalysis and in magnetic separation techniques. This review summarizes recent commercial, industrial and bio-engineering applications and brief study of the methods for the preparation of iron oxide magnetic nanoparticles with a control over the size, morphology and the magnetic properties. Some future applications of microwave irradiation for magnetic particle synthesis are also addressed.

KEYWORDS:

Applications; Magnetic nanoparticles; synthesis routes

REFERENCES

1. Alivisatos, A.P. Semiconductor clusters, nanocrystals, and quantum dots. (1996) *Science*, 271 (5251), pp. 933-937.
2. Weller, H. Colloidal Semiconductor Q-Particles: Chemistry in the Transition Region Between Solid State and Molecules. (1993) *Angewandte Chemie International Edition in English*, 32 (1), pp. 41-53
3. Schwertmann, U., Cornell, R.M. (2000) *Iron Oxides in the Laboratory*, 1, pp. 1-18. WILEY-VCH Verlag GmbH, D-69469 Weinheim, Federal Republic of Germany
4. Fendler, J.H. (1998) *Nanoparticles and Nanostructured Films*, pp. 1-3. Wiley- VCH, Weinheim.
5. Mahmoudi, M., Sant, S., Wang, B., Laurent, S., Sen, T. Superparamagnetic iron oxide nanoparticles (SPIONs): Development, surface modification and applications in chemotherapy. (2011) *Advanced Drug Delivery Reviews*, 63 (1-2), pp. 24-46.