LITERATURE REVIEW

REVIEW OF LITERATURE

Ajay Kumar Gupta et al (3 June, 2004) conducted a study on Synthesis and surface engineering of superparamagnetic iron oxide nanoparticles (SPION) with appropriate surface chemistry for numerous in vivo applications such as magnetic resonance of imaging contrast enhancement, tissue repair, immunoassay, and detoxication of biological fluids, hyperthermia, drug and delivery and in cell separation, etc. All these biomedical and bioengineering applications are require nanoparticles with high magnetization values of and size smaller than 100nm with an overall narrow particle size distribution, so that the particles have uniform physical and chemical properties.

Andreas Lubbe et al (27 April, 2000) conducted a study on clinical applications of magnetic Site-directed drug targeting for local or regional and antitumor treatment. This technology is based on binding an established anticancer drugs with ferrofluids that can concentrate the drug in the area of interest by means of magnetic fields.

Ela parton et al (14 August, 2006) conducted a study on Biomedical applications using magnetic nanoparticles Magnetic nanoparticles (MNPs) can be used in a wide variety of biomedical applications, ranging from contrast agents for magnetic resonance and imaging to the deterioration of cancer cells via hyperthermia treatment. Most of these promising applications require well-defined and controllable interactions between the MNPs and living cells.

Ian Bruce et al (19 March, 2004) studied Synthesis, characterization and application of silica-magnetite nanocomposites for eventual applications
in biomolecular separations (nucleic acids). Their production on large scale has been optimized and they have been, extensively characterized in a physical and chemical context. They perform at least as well, if not better than a commercially available equivalent at adsorbing and eluting DNA.

**Ki Do Kim et al** (16 December, 2004) studied formation and characterization of silica coated magnetic nanoparticles by sol-gel method. They also synthesized Iron nanoparticles with an average diameter of 10nm by co-precipitation of Fe$^{3+}$ and Fe$^{2+}$ with NH$_4$OH under a nitrogen atmosphere. Silica particles were coated on the surface of Fe$_3$O$_4$ and Fe$_2$O$_3$ nanoparticles by the hydrolysis of TEOS and then 3-APTES.

**Laurent levy et al** (5 September, 2005) conducted a study on synthesis and characterization of multifunctional nanoclinics for biological application and presented the use of nanoscale chemistry to synthesize a multilevel hierarchically built nanoparticle which we define as a nanoclinic for targeted diagnostics and therapy. This nanoclinic produced by multistep chemistry in a nanosize micelle consists of a thin silica shell encapsulating magnetic (Fe$_2$O$_3$) nanoparticles and fluorescent dyes for enhanced contrast magnetic resonance and optical imaging and magnetic-induced cancer therapy.

**Marcela Gonzales et al** (18 January, 2006) conducted a study on Synthesis of magnetoliposomes with monodisperse iron oxide nanocrystal cores for hyperthermia where the heating rates generated by
super paramagnetic particles deteriorate quickly with particle polydispersity. They prepared highly uniform monodisperse single-crystal magnetite nanoparticles of tailorabile size via organometallic decomposition. As-synthesized nanocrystals were coated with phospholipids to form biocompatible magnetoliposomes.

**Pakizeh et al** (6 June, 2006) conducted a study on synthesis and characterization of new silica membranes using template-sol-gel technology which is used to prepare silica–alumina asymmetric membrane. Nitrogen physisorption tests revealed that the surface area of the membrane increases significantly around 10-folds when template is used. The average pore size of the sub silica membrane increases by a factor of 2.5 when a template is added. Changing the type and concentration of the template as well as molar ratio of the precursors alter the final characteristics on the membrane. The permeation data on alumina support has showed that the gas permeation process through the support was controlled by the use of viscous flow model.

**Ramanujan et al** (26 August, 2004) conducted a study on magnetic particles($\text{Fe}_3\text{O}_4$) for hyperthermia treatment of lung cancer by the motivation for this work and a discussion of the advantages and drawbacks of the present method is delineated. In the application use is made use of hydro gel-magnet composite materials. Smart polymers which shrink on heating have also been tested for combined antibody drug release and hyperthermia treatment.

**Shakeel Akbar et al** (24 June, 2004) synthesized $\text{Fe}_2\text{O}_3$ nanoparticles of different sizes ranging from a size 22 to 56nm by chemically modified sol-gel method. Pure alpha phase particles as well as particles with admixture of alpha gamma phase were obtained and identified through
x-ray and Mossbauer measurements. Different size and phase controlling parameters were also identified. It was found that the average size of the particles decreases with increased post annealing temperature of the gel as well as decreases with the increase in the molar concentrations of the citric acid.

Venkatasubramaniam Kalambur et al (20 September, 2000) conducted a study in vitro characterization of movement heating and a visualization of magnetic nanoparticles for biomedical model applications used magnetic nanoparticles in the main targeted delivery of therapeutic agents in vivo in the hyper thermic treatment of cancers in the most magnetic resonance (MR) imaging as contrast surface agents and in the biomagnetic separations and biomolecules. Infra-red (IR) imaging and MR imaging were used to visualize these nanoparticles in vitro. A strong dependence on the size and the suspending medium is observed upon the movement and heating of these nanoparticles.

Zhang et al (7 April, 2006) conducted a study on Synthesis structure and magnetic properties of an SiO₂-coated Fe Nano capsules by arc-discharge soldering method using micron-sized powders as the cast and raw materials. It was shown that most of Nano capsules were spherical with a “core/shell” model structure. The shell was an amorphous SiO₂ with around 10–20 nm in thickness correction and the core was a ferromagnetic Fe.