

Magnetic Nanoparticles : Synthesis

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The term “nanoparticles” refers to materials whose dimensions vary from 1 to 100 nm. Magnetic nanoparticles (MNPs), first introduced in 2003^[1], are those nanoparticles that present response to an applied magnetic field. They consist of two main parts; a magnetic material (such as Fe, Ni, Co) and a functional chemical component, either natural or synthetic (Figure 1B).

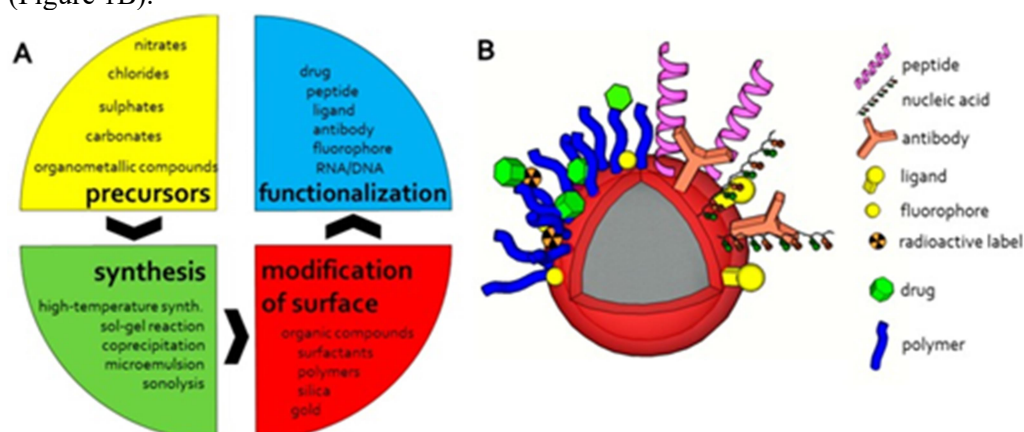


Figure 1: The scheme of magnetic particles design workflow (A) and possible modification and functionalization of magnetic particles (B)^[2].

The aim of this report, as per its title, is to present the methods that can be used to synthesize such particles. These methods, by name, are co-precipitation, thermal decomposition, microemulsion and flame spray pyrolysis^[3]. In the recent years, substantial progress was made in the synthesis of MNPs of desired size, morphology, chemical composition and surface chemistry. Thus, by being able to design and synthesize MNPs, there are new paths created for non-invasive medical imaging, targeted drug delivery and other such fields of biomedicine^[4].

References

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