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Nano materials for data storage

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Nanomaterials have been the topic of intense industrial research for the past several years. They have unique physical, chemical, optical and magnetic properties as compared to those of their bulky counterparts. Intense research has been done on reducing the size of memory devices in the electronics industry. This requirement has made it extremely urgent to explore the materials with larger scope of functionalities on their surfaces. In this respect the conventional silicon based materials have been engineered for better and better control and modification of their surfaces but unfortunately this conventional route does not provide us with both higher functionalities as well as high speeds. In this regard, magnetic nanomaterials have been researched for interesting and far sighted effects.

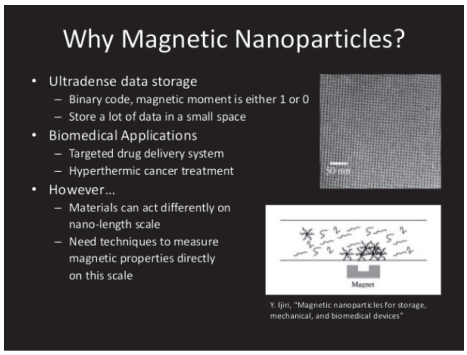

Figure 1: Advantage of magnetic nanoparticles

These have been the hot destinations for their sensitive responses in the biomedical and diagnostic applications. Magnetism at nanoscale is also significantly different from the one observed at bulk scale. Magnetic nanoparticles are normally made up of materials, which have sensitive magnetic properties arising from the unpaired electrons in their d-orbitals and their coupling effect with their nuclear spins. This review explores the synthesis methods of the magnetic nanomaterials and their possible implementation in making memory based electronic storage devices. This also highlights the significant benefits and aspects that compel the use for investigating memory based potential for magnetic nanomaterials [1]. Demand for data storage continues to grow at over 40% per annum, in part as a result of increasing movement of data to the cloud. All segments of the hard drive market remain in demand and the recording transducer is critical for storage capacity [2].It is a known fact that the key for GOOGLE EARTH operating is that it has 200 TB of Hard disk drives and 92% of new information is stored on Magnetic Media.

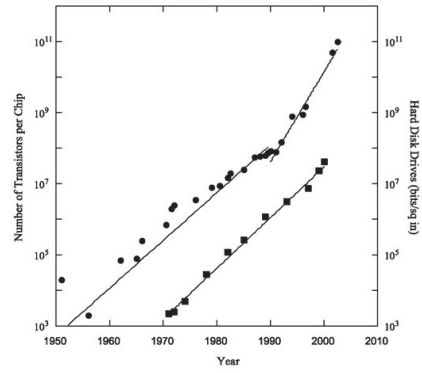

Figure 2: Growth of data storage density for magnetic disks

References

1. International Journal of Advance Research, Volume 1, Issue 1, 2013, Online: ISSN 2320-9097. Synthesis and Application of Magnetic Nanomaterials for Memory Storage Devices.

2. Engineering and Physical Sciences Research Council (EPSRC). EPSRC, EP/N510063/1. Title: Nano Materials for Smart Data Storage. URL: http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/N510063/1