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Magnetic properties of positive and negative charged superparamagnetic nanoparticles GAMAGE DANNANGODA, KAREN MARTIROSYAN, BORIS ERMOLINSKY, University of Texas at Brownsville — Magnetic iron oxide nanoparticles particularly well known drug-delivery vehicles since their surfaces can be easily modified with antibodies to target specific receptors on tumor cells. The advantages of specific properties of superparamagnetic magnetic nanoparticles can be used as magnetic responsiveness and magnetic imaging. In this report we studied magnetic properties of positive and negative charged magnetite Fe3O4 nanoparticles. The electrical potential of the particles were varied from -33 mV up to 45 mV. Saturation magnetization and coercivity were obtained from the hysteresis loops at room temperature and 5K under a maximum applied field of 9T. The higher saturation magnetization for positive particles was Ms=53 emu/g at 300K compared to negative particles (Ms=25emu/g at 300K) could be the effect of higher mean particle size or higher grain size of magnetization of positive charged particles. Zero-field-cooled (ZFC) and field-cooled (FC) magnetization curves were measured in the temperature range of 1.9-300K using magnetic field of 100Oe. Zero coercivity and remanent magnetization and merging point indicate that the particles are superparamagnetic at the room temperature.

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