

عنوان مقاله:

Electrosynthesis of PEG/PEI Coated Fe₃O₄ Nanoparticles for Biomedical Applications

محل انتشار:

دوازدهمین سمینار سالانه الکتروشیمی ایران (سال: 1395)

تعداد صفحات اصل مقاله: 2

نویسندگان:

.Mustafa Aghazadeh - *NFCRS, Nuclear Science and Technology Research Institute (NSTRI), Tehran, Iran*

Isa Karimzadeh - *Shefa Neuroscience Research Center, Khatam ol Anbia Specialty and Subspecialty Hospital, Tehran, Iran*

خلاصه مقاله:

Recently, increased investigations with several types of iron oxides have been carried out in the field of magnetic nanoparticles (NPs) mostly includes magnetite (Fe₃O₄, superparamagnetic when the size is less than 15 nm), hematite (α -Fe₂O₃), maghemite (γ -Fe₂O₃) [1]. Among them, magnetite is the very promising and popular candidates [2]. However, it is a technological challenge to control size, shape, stability, and dispersibility of NPs in desired solvents. Magnetite NPs have a large surface-to volume ratio and therefore possess high surface energies. Consequently, they tend to aggregate so as to minimize the surface energies. Moreover, they have high chemical activity, and are easily oxidized in air, generally resulting in loss of magnetism and dispersibility. Therefore, providing effective coating strategies and developing novel synthetic methods to prepare stable monodisperse iron oxide NPs is very important. Herein, we report preparation of naked and polymer coated Fe₃O₄ nanoparticles by an effective electrochemical method. In this way, in a two-electrode system and using base electrogeneration on the cathode surface, pure magnetite phase of iron oxide and also double coated with polyethylene glycol/polyethyleneimine polymers were successfully electrodeposited on the cathode surface. The structure and composition of the prepared nanoparticles were identified by SEM, TEM, DLS, XRD, FTIR, and TG analyses. The PEG/PEI coat on the surface of Fe₃O₄ nanoparticles was confirmed by IR and TG data. The superparamagnetic properties of the prepared nanoparticles were characterized through VSM data.

کلمات کلیدی:

Fe₃O₄, Electrochemical synthesis, Polymer coating, Biomedical applications

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/800814>

