

MAGNETIC PROPERTIES OF BIOCOMPATIBLE MAGNETIC FLUID AFTER ELECTRON IRRADIATION

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Magnetic fluids for biomedical applications mainly consist of nano sized iron oxide particles Fe₃O₄ or γ -Fe₂O₃ coated with biocompatible polymer suspended in carrier liquid, usually water at neutral pH or physiological salinity. The radiation stability of biocompatible magnetic fluids after electron irradiation with electron energy 8MeV was studied. The magnetic particles in the water-based magnetic fluids were sterically stabilized by sodium oleate to prevent their agglomeration and consequently the adsorption of poly-ethylene-glycol (PEG) was carried out to improve the biocompatibility of the magnetic particles. Two sets of samples were prepared. The first set of the samples was with different molar weight of PEG (Mw = 400, 1000, 10 000 and 20 000) at the constant weight ratio of PEG/Fe₃O₄ = 0.25 and the second one was with different weight ratio of PEG/Fe₃O₄ and constant molar weight of PEG (Mw = 1000). The samples were irradiated with 20Gy. The same reduction of saturated magnetization (about 10%) after electron irradiation with 20Gy was observed for all prepared samples.

9.7 cm

13.4 cm

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