

Effect of Fe Magnetic Nanoparticles in Rubber Matrix

Young Rang Uhm^{1*}, Jaewoo Kim¹, Jiheon Jun¹, Sol Lee¹, Chang Kyu Rhee¹, and Chul Sung Kim²

¹*Nuclear Materials Research Division, Korea Atomic Energy Research Institute (KAERI), Daejeon 305-353, Korea*

²*Nano-electro Physics, Kookmin University, Seoul 136-702, Korea*

(Received 16 September 2010, Received in final form 17 December 2010, Accepted 20 December 2010)

A new kind of magnetic rubber, Fe dispersed ethylene propylene monomer (EPM), was prepared by a conventional technique using a two roll mill. The magnetic fillers of Fe-nanoparticles were coated by low density polyethylene (LDPE). The purpose of surface treatment of nanoparticles by LDPE is to enhance wettability and lubricancy of the fillers in a polymer matrix. The mechanical strength and microstructure of the magnetic rubber were characterized by tensile strength test and scanning electron microscopy (SEM). Results revealed that the Fe nanoparticles were relatively well dispersed in an EPM matrix. It was found that the nano- Fe dispersed magnetic rubber showed higher coercivity and tensile strength than those of micron- Fe dispersed one.

Keywords : magnetic rubber, ethylene propylene monomer (EPM), nanocomposite