

Modification of the Materials for Dielectric Coating with Detonation Nanodiamonds

Schadilova E.E., Rodin V.M., Voznjakovskii A.P., Ramsh A.S.

Lebedev Rubber Research Institute, Gapsalskaja 1, 198035 St.Petersburg, Russia

Polymeric materials, possessing of a good dielectric properties and stable to aggressive environments are nowadays required by modern technologies.

By the way to this aim we have synthesized a film-forming polyfluorinated elastomers using the method of emulsion polymerization. It is a copolymer with alternating units of ethylene and perfluorinated ethers in its chain. These copolymers possess excellent resistance to various environments, including polar and nucleophilic. But this method have some disadvantage, such as presence of mobile ions in end-product which considerably decrease dielectric properties. In order to suppress diffusion of such ions we have proposed to enter into polymer active adsorbent. Detonation nanodiamonds (DNA) are perfectly approach as such adsorbent. The DNA being built in hydrocarbon clusters decreasing diffusion permeability of films.

We have shown that modification of polymer by 2-3 mass.% of DNA allow to improve mechanical and dielectric properties of thin films. We have arrived at the conclusion that received composite material is perspective for use as dielectric coverings.