

TIME DEPENDENCE OF ELECTRICAL RESISTANCE OF POLYISOPRENE-NANOSTRUCTURED CARBON COMPOSITES AT VARIOUS MECHANICAL LOADING VALUES

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Electrical resistance vs both tensile strain and stress (the tensoresistive effect) in polyisoprene-nanostructured carbon nanoparticle composites (nanocomposites) is experimentally studied. Dependence of the electrical resistance on time, strain and stress at different values of the mechanical load on nanocomposites is examined. Electrical resistivity and stress of the composites as functions of time are shown in Fig. 1. High structure carbon nanoparticles (mean diameter 30 nm, dibutyl phthalate adsorption 380ml/100g, specific surface 950 m²/g) and multi-wall carbon nanotubes (MWCNT) have been used as the filler. Finally the character of mechano-electric relaxation of the composites is compared and relaxation models proposed.

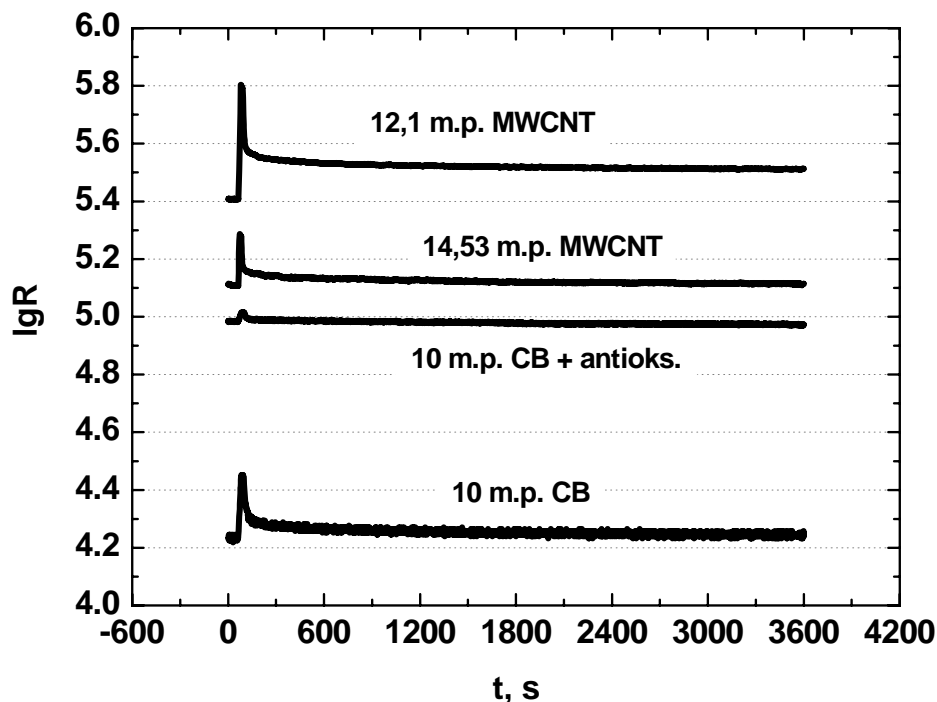


Fig.1. Electric resistance of polyisoprene – nanostructured carbon composites as function of time at 3.33% strain; m.p. - mass part of filler per 100 parts of polyisoprene.