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Electrical/dielectric properties and conductivity mechanism of epoxy/expanded graphite composites ATHANASIOS KANAPITSAS, Technological Educational Institute of Lamia, EMMANUEL LOGAKIS, CHRISTOS PANDIS, POLYCARPOS PISSIS, National Technical University of Athens, NATASA JOVIC, VLADIMIR DJOKOVIC, Vinca Institute of Nuclear Sciences — In this work the electrical and dielectric properties, as well as the temperature dependence of the electrical conductivity of epoxy/expanded graphite (EG) composites, are studied by employing dielectric relaxation spectroscopy (DRS). For the preparation of the composites EG was sonicated in acetone for 10h and then the appropriate amount of epoxy resin added to the mixture. The sonication was prolonged for another 3 h. The mixture was dried at 60°C for a few hours and then the appropriate amount of hardener (triethylenetetramine) was added followed by mechanical stirring for 15 min. Finally, the mixture was cast in a glass mould and outgassed overnight at room temperature. Before they were removed from the mould, all samples were post-cured at 127°C for 10 min in air. Samples with EG weight fractions ranging from 0 to 8 wt.% were produced. Preliminary DRS results at room temperature indicate that electrical percolation threshold (p_c) lies between 3-5 wt.% EG. The influence of the EG fillers (for concentrations below p_c) on the dielectric relaxation mechanisms of the epoxy matrix, as well as the conductivity mechanism (for concentrations above p_c) are investigated.

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