

## Heating Influence on the Electric Conductivity of the Epoxy-Bi<sub>50</sub>Pb<sub>25</sub>Sn<sub>12,5</sub>Cd<sub>12,5</sub> Composite

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The main object of research is to evaluate the volume resistivity of polymer–metal composites. In the research, Bi<sub>50</sub>Pb<sub>25</sub>Sn<sub>12,5</sub>Cd<sub>12,5</sub> alloy was used and an epoxy resin with hardener. Used in research alloy, commonly known as Wood's alloy, are a material with a low melting point of approximately 65°C.

Composites were made with different weight fraction of the alloy: 0, 20, 40, 60, 80% by weight fraction of the Wood's alloy in to epoxy resin complex.

The idea of presented research is verification of possibility to a variable in a physical state of the material as polymer fillers. The use of that fillers whose functional properties depend on the ambient temperature gives the possibility to obtain a new class of smart materials. The Bi<sub>50</sub>Pb<sub>25</sub>Sn<sub>12,5</sub>Cd<sub>12,5</sub> undoubtedly can be included as this type of fillers. The molten Wood's alloy definitely has different physical characteristics than the constant. The tests of electrical conductivity of the epoxy-Wood's alloy composite confirm these assumptions.

The performed research has proven that there resistivity dependence of the concentration of the alloy and the temperature. With the increase of the share of the weight alloy Wood's, resistivity decreases. The resistivity of samples decreases as the ambient temperature increases.

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