

Thermal conductivity of metal-containing polymer nanocomposite materials

R.V. Dinzhos¹, N.M. Fialko²

¹ *Mykolayiv National University named after V.O. Sukhomlynskiy, Nikolska Str., 24, Mykolayiv-54030, Ukraine.*

E-mail: dinzhos@mail.ru

² *Institute of Engineering Thermophysics, NAS of Ukraine, Zhelyabov Str, 2a, Kyiv-54030, Ukraine.*

Modifying the polymer matrix different fillings (nature, geometry, dimensions) can obtain materials with radically different properties [1-3]. Increased interest in such materials is linked with the ability to create new nanocomposite polymer materials with improved corrosion properties and relatively high thermal conductivity. Today, most of the heat power complex products are based metals or alloys.

The main requirement is to put forward products have high thermal conductivity. Alternative use metal - the use of polymeric composite materials (PCM) containing metal particles with high thermal conductivity (aluminum, copper, metal oxides, etc.).

Great interest for the production of heat-conducting elements are exactly metals and metal oxides, as they greatly increase the electrical, mechanical and thermal properties of polymer matrix with a small filling.

From the input of particles in a polymer matrix, particle size, particle geometry, uniform distribution of the particles depends on the value of electrical conductivity and thermal conductivity at the same mass content of metal particles.

The results of experimental studies and theoretical analysis of thermal conductivity composites based on thermoplastic polymers.

1. *Agari Y., Ueda A., Nagai S.* Thermal conductivity of a polymer composite // *J. Appl. Polym. Sci.*-1993.-**49**.-P.1625-1634.
2. *Krupa I. and Chodak I.* Physical properties of thermoplastic/graphite composites // *Eur. Polym. J.*-2001.-**37**.-P.2159-2168.
3. *Han Z., Fina A.* Thermal conductivity of carbon nanotubes and their polymer nanocomposites: a review // *Prog. Polym. Sci.*- 2011.-**36**.-P.914-944.