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STRUCTURE INVESTIGATION OF NANOCOMPOSITES CONTAINING GRAPHENE

Jarosław Janicki, Marta Sieradzka, Ryszard Fryczkowski, Beata Fryczkowska and **Czesław Ślusarczyk**

University of Bielsko-Biala, Poland

Graphene, which is a unique two-dimensional carbon nanostructure, has low density, high specific surface area. It has inspired enormous interests because of its outstanding mechanical, thermal and electrical properties. Due to its extraordinary mechanical, chemical, thermal and electronic properties, graphene possess the wide range of possible uses as biosensors, electronic devices, energy conversion and storage, solar cell. A very important field of graphene applications is polymer composites. Graphene nanoplatelets are one of the most widely used forms of graphene; consist of stacks of several graphene monolayers with thickness of up to approximately 10 nm. Fortunately, compared to monolayer graphene, graphene nanoplatelets were mass production with low cost, and also have excellent mechanical and electrical properties. During recent years, a number of groups have explored the fabrication of nanocomposites reinforced with graphene nanoplatelets. Modification of polymers with graphene may eventually lead to production of new composites with properties similar to those of pure graphene i.e. materials with improved electrical, thermal, mechanical or with greater capacity to absorb electromagnetic waves. In this paper will be shown results from research on attempts to modify polyester (PET) with graphene. This will be presented in both laboratory fibers formation tests and technological attempts at industrial conditions. For the obtained fibers results of thermal (DSC, TGA), mechanical, structural and spectroscopic method will be shown. The proposed method is simple and inexpensive way of obtaining a thermoplastic polymer nanocomposites containing graphene.

jjanicki@ath.bielsko.pl