Carbon nanocomposite materials with gold nanoparticles

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Abstract:

In this article, the method of synthesis of carbon nanocomposite materials with gold nanoparticles was presented. The characterization and potential application of these films based on their photoelectric and / or photothermal properties were shown.

The method of obtaining a new type of carbon-based composite film with gold nanoparticles (C-Au film) has been developed in the Łukasiewicz Research Network - Tele and Radio Research Institute. Gold nanoparticles, due to their different properties on the nano scale compared to the macro scale, are widely used in many fields of science, including electronics, catalysis, medicine, photovoltaics, biological sensors and others. C-Au films were prepared by the PVD method at different technological process parameters. In this method, C-Au films can be applied directly to various substrates, which enable many types of electrical connections. The amount and size of Au nanoparticles in the nanocomposite can be also investigated.

The results of topography studies obtained by using scanning electron microscopy (Fig. 1a), morphology properties obtained through ultra-high resolution scanning transmission electron microscopy (Fig. 1b), elemental analysis - energy dispersive X-ray spectroscopy, crystal structure – X-ray diffraction and electron structure - visible and near ultraviolet spectroscopy will be discussed.

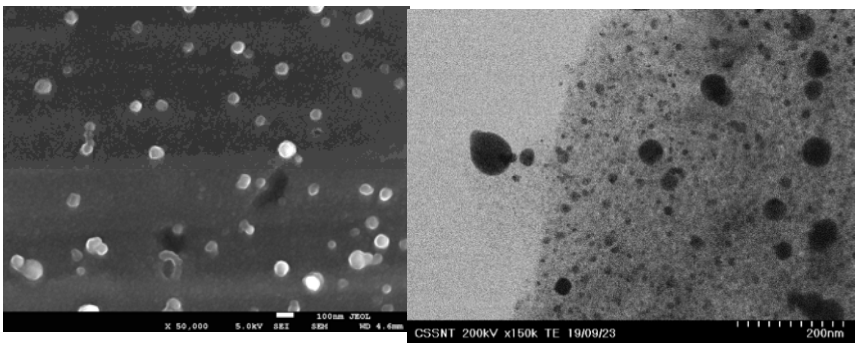

Fig. 1 a) SEM image of topography of C-Au film, b) TEM image of C-Au film