Organic-inorganic Nanocomposites for Electrode Applications

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Thin film flexible electrodes for printing technologies are attractive for manifold applications in electronic devices during the last decade. Transparent electrodes conduct electrical current and allow light to pass through. Such electrodes are required for photo-voltaic, electroluminescent devices, touch screens etc. Electrodes with high surface area are developed for supercapacitors and dye sensitized solar cells. Conducting polymers, metal colloids, and carbon nanomaterials are used for the development of printable and flexible electrodes. The ideal electrode can be made from graphene. However, this process is expensive. One of the possible roots for the creation of printable flexible electrodes is based on organic-inorganic nanocomposites.

In this talk our achievements on the creation approaches and physical properties of nanocomposites based on conducting polymer or other organics material and metal nanoparticles or carbon nanomaterials, partially graphene are presented. We showed that the replacing of aliphatic shell of metal nanoparticles with aromatic one in polymer-metal nanocomposite, and application of triple nanocomposite results in conductivity increase without transparency loosing. Good results are obtained with graphene-metal nanoparticles nanocomposite.

References

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