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## Polyaniline Composites with Metal Nanoparticles

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Electrically conductive polymers, which include polyaniline (PANI), represent a new class of synthetic materials that combine the chemical and mechanical properties of polymers with the conductive properties of metals and semiconductors. Since the 60yrs of the XX century, conductive polymers have become the object of close attention of researchers due to the possession of special properties caused with the presence in their structure of a conjugated bond system. Polyaniline and its composites with metal nanoparticles are increasingly used in such areas as medicine, electronic and optical devices, biosensors. We have developed an effective method for matrix polymerization of aniline using polyvinylpyrrolidone (PVP) of various molecular weights, carboxymethyl cellulose and dodecylbenzenesulfonic acid as steric stabilizers. Methods for the synthesis of polyaniline with NPs of silver, nickel, cobalt, copper, iron oxides, cerium dioxide, composites PANI/Ag/CeO<sub>2</sub>, PANI/Fe<sub>3</sub>O<sub>4</sub>/CeO<sub>2</sub>, Ag/CeO<sub>2</sub> and CeO<sub>2</sub>/Ag using the methods of ultrasonic and hydrothermal synthesis are proposed. The dimensional parameters of composites, using the methods of dynamic light scattering, optical, scanning and transmission electron microscopy, are determined. The sizes of agglomerates of nanoparticles ranged from 10 to 100 nm and the sizes of their PANI composites ranged from 1 to 28 μm, depending on their nature. Composites were used for the subsequent production of polyvinyl alcohol films on their basis and the study of their physicochemical characteristics.

### Biography:

Novik Khrystsina, MSc in Chemistry, junior researcher, laboratory of optical multifunctional films at the Institute of Chemistry of New Materials of the National Academy of Sciences of Belarus.

Research Interests: Methods for producing of iron oxides, silver, cerium dioxide nanoparticles and their composites with bioactive compounds of the 2-arylaminoimidazole series, production of polyaniline and its composites with metal nanoparticles.