

Modification of cerium oxide nanoparticles with polymeric materials

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In recent years, cerium oxide nanoparticles (CeO₂ NPs) have attracted special attention due to their properties such as antioxidant, anti-inflammatory and antibacterial activity. Polymers are used as good coating agents to improve the colloidal stability and dispersibility of CeO₂ NPs. A thinner layer of polymers preserves the catalytic activity of cerium oxide without blocking the electron charge transfer pathway on the nanoparticle surface. The relevance of the development of CeO₂ NPs with a polymer shell lies in the fact that polymers can bind to various drugs and bioactive substances, becoming carriers of drugs. We presented the synthesis of CeO₂ NPs with polymers of different composition and molecular weight to study their effect on the structure and size of CeO₂ NPs. During the synthesis, the optimal concentration of cerium (III) nitrate hexahydrate, which is used in the synthesis as a precursor for the formation of CeO₂ NPs, was selected. The influence of the medium on the possible agglomeration of NPs during purification and further storage was studied. The size and concentration of the obtained particles was investigated using dynamic light scattering.

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