

Physico-chemical nanomaterials science

Electrochemical properties of Silver-Doped Hydroxyapatite Nanoparticles

E. Skwarek

Department of Radiochemistry and Colloid Science, Faculty of Chemistry, Maria Curie-Skłodowska University, M. Curie-Skłodowska Sq. 3, 20-031 Lublin, Poland. E-mail: ewunias@hektor.umcs.lublin.pl

Synthesis of the hydroxyapatite nanoparticles doped with silver, possessing antibacterial properties, has great importance for a new biomedical applications development. The aim of the researches described in this chapter was assessment of $\text{Ca}_{10-x}\text{Ag}_x(\text{PO}_4)_6(\text{OH})_2$ nanoparticles (Ag:HAp-NPs) and its electrochemical properties. In this paper the new synthesis method of nanocrystalline hydroxyapatite with silver addition has been described.

Hydroxyapatite and hydroxyapatite with add Ag was prepared by the wet method. Particle size was measurements of Zetasizer Nano ZS. Specific surface area of obtained sample has been determined by BET method. XRD (X-ray) diffraction analysis revealed, that crystallographic structure of the sample is hydroxyapatite. Potentiometric titrations and electrophoresis measurements were performed at 4–11 pH range. As a background electrolyte NaCl, solution was used at concentrations 0.1, 0.01 and 0.001 mol dm⁻³.

Raise of the calcium or phosphorus added to hydroxyapatite has influence on the crystallites size. Specific surfaces of the researched powders as well as shape and particles sizes were also affected. Characteristic points of the electric double layer: pH_{pzc} and pH_{iep} has been changing with Ag concentration variations.

1. Eraković S., Janković A., Veljović D., Palcevskis E., Mitrić M., Stevanović T., Janačković D., Mišković-Stanković V., Corrosion stability and Bioactivity in Simulated Body Fluid of Silver/Hydroxyapatite and Silver/Hydroxyapatite/Lignin Coatings on Titanium Obtained by Electrophoretic Deposition// J Phys Chem B.-2012.- 117(6).-P. 1633–1643.

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