

Physico-chemical nanomaterials science

Electrical double layer at the hydroxyapatite/electrolyte interface.

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An electrical double layer (edl) existing on the solid (hydroxyapatite)-solution interface is essentially connected with the surface properties of the system. The amount of accumulated charge influences the adsorption of ions. In the latter case it also influences the configuration of the adsorbed species and particle size. On the other hand, the adsorption of the ions varies surface properties of the interface and thus, the distribution of the charge in the interfacial region. The existence of the electric charge at the interface influences the dispersed system stability [1].

Hydroxyapatite and hydroxyapatite with add Ca and P was prepared by the wet method. Particle size was measurements of Zetasizer Nano ZS. For characterization of hydroxyapatite surface STM has been used. 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, KCl and CsCl 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 Ca and P amount and electrolyte variations.

1. Janusz W. Electrical Double Layer at the Metal Oxide/ electrolyte interface in Interfacial Forces and Fields: Theory and applications surfactant Sci. vol85, M.Dekker, New York 1999, Chapter 4.

Acknowledgement The research leading to these results has received funding from the People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme FP7/2007-2013/ under REA grant agreement noPIRSESGA-2013-612484.