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Study of the surface properties of hydroxylapatite during sorption of amino acids

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Abstract

Calcium phosphates are part fusiogenic and pathogenic mineral formations. It is known that hydroxylapatite is the main mineral component of bone tissue, tooth enamel and dentin. There are a number of assumptions, according to which the basis of the processes of mineralization lies to the adsorption interaction of free amino acids and associated protein molecules with inorganic components in body fluids and emerging phases. However, the mechanism of their interaction is not fully understood.

In this paper studied the adsorption of amino acids on the surface of hydroxylapatite. It was carried out the synthesis of calcium phosphates from solution. According to the results of XRD and IR spectroscopy established that precipitation is represented by the phase of hydroxylapatite. It was investigated the adsorption of amino acids in a wide range of variation in their concentrations and the pH of the solution. It was established that adsorption of amino acids on the surface of hydroxylapatite reaches saturation. It was considered the effect of pH on the maximum adsorption of amino acids on hydroxylapatite. It was established that adsorption of amino acids is described by the model of Langmuir. The result of IR spectroscopy was shown to confirm adsorption. It was determined by the sign of the surface charge of the solid phase of hydroxylapatite. It was calculated the values of the Gibbs energy and revealed that the interaction of amino acids with the surface of the hydroxylapatite is characterized by physical adsorption.

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