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two stages: the first stage which took place from 40 °C up to 200 °C associated with the removing of adsorbed water and the second stage (from 200 to 600 °C), associated with the removing of crystallization water and decomposition of ammonium nitrate. Molecular formulas of synthesized hydrated phosphates were deduced from these data as $Ca(PO_3)_2 \cdot H_2O$ and $Ca_2P_2O_7 \cdot 2H_2O$.

According to XRD analysis of samples of ceramics, it has been found that for all examples, except the 100% content of pyrophosphate, the ratio between polyphosphate and pyrophosphate pointed before ion exchange was not saved after calcination. Amount of calcium pyrophosphate phase grew in comparison with expected values with increasing Ca/P in the samples. This phenomenon was probably associated with possible thermal hydrolysis of calcium polyphosphate during heat-treatment.

The density of the samples decreases, and the porosity increases with increasing of the content of calcium polyphosphate phase. Despite the low density, these samples demonstrated sufficient strength due to the presence of, calcium polyphosphate forming the melt during sintering. According to SEM micrographs the samples with the high content of polyphosphate had the network of interconnected pores.

The powders of calcium phosphates with a ratio of $0.5 \leq Ca/P \leq 1$, which were obtained by means of the wet precipitation method from solutions of condensed phosphate acids prepared by ion exchange method, had rather uniform composition. Such ceramics consisted of calcium poly- and pyrophosphates are suitable for making bone implants due to high resorption and osteoconductivity.

A43

SIMULTANEOUS THERMAL ANALYSIS AND DILATOMETRIC STUDY OF HAp-$LiFePO_4$ SYSTEM

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Sintered hydroxyapatite bioceramics have been widely studied as a potential material for bone tissue reparation, however, concerning its microstructural and mechanical properties some limits were achieved at the moment. Addition of other materials that could improve functionalities, while preserving inherent advantages of this bioactive ceramics is desirable strategy. In this work, a new idea of addition of lithium iron phosphate as hydroxyapatite sintering aid, provoking liquid phase sintering in the intermediate sintering phase, has been evaluated from the point of view of thermal and dilatometric studies in inert atmosphere, with coupled mass spectroscopy monitoring. Detailed characterization of prepared materials and sintered products is given, confirming the proof of concept. Sintering ability was significantly enhanced and important microstructural features were obtained.