SYNTHESIS OF NANOHYDROXYAPATITE USING MICROWAVE ENERGY

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Introduction

Hydroxyapatite (HAp) is a calcium phosphate compound having a chemical formula $Ca_{10}(PO_4)_6(OH)_2$. It is an inorganic component of hard tissues such as bones and teeth, which is responsible for strength and stiffness. It has been used extensively for biomedical applications, because of osteoconductive property and biocompatibility with human body. Hydroxyapatite is using in regenerative medicine e.x. bone implants for regeneration of bone defects.

Materials and Methods

Nanohydroxyapatite was synthesised by using precipitation method in room temperature and hydrothermal synthesis using microwave reactor MSS2. Thanks to the microwave energy we can easily control the grain size of nanoparticles. Obtained nanoparticles were in the range of 8 - 45 nm grain size. Phase purity was measured using X-ray diffraction. Thanks to scanning electron microscopy (SEM) the morphology of produced nanohydroxyapatite was characterized. The density and specific surface area were determinated using helium pycnomerty and BET method.

Results and Discussion

We obtained 6 types of hydroxyapatite with different crystallinity degree and grain size. Wide variety of GoHAP can be used in many applications (e.x. implants, scaffold layers).

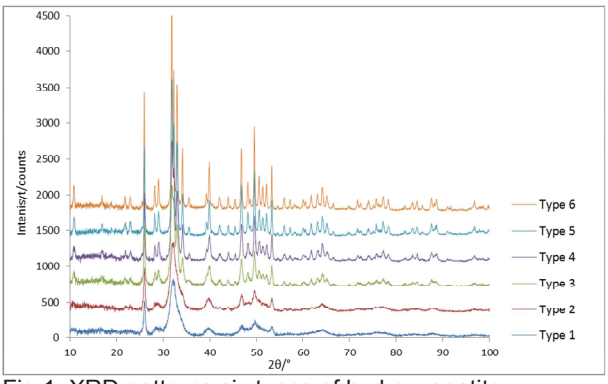

Fig.1. XRD patterns six types of hydroxyapatite.

Conclusions

The Laboratory of Nanostructures is able to synthesize innovative HAp nanoparticles. GoHAP could be a perfect component of the medical implants thanks to good similarity to the natural apatite.

Acknowledgments

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References

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