

## STUDY OF PREPARATION AND PROPERTIES OF CA-PHOSPHATES/ZRO<sub>2</sub> BIOCOMPOSITES

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### Abstract

Bioceramic composite materials based on Ca-phosphates containing fibres of tetragonal ZrO<sub>2</sub> were prepared using method of electrophoretic deposition (EPD). The main objective was the study of influence of dispersion composition on the mechanical, chemical and biological properties of bioceramic composites. Dispersions were composed from 0.85, 1.70, 4.25, 12.75, or 21.25 wt.% of monochloroacetic acid (MCAA), 15 wt.% of ceramic load and isopropanol medium. Dispersions were pre-treated by high-energy milling in planetary ball mill before EPD. Electrophoretically deposited Ca-phosphates had a rough surface and contain a large number of cracks. The quality of deposits was improved by addition of 0.05, 0.11, 0.16 or 0.23 g/l of indifferent electrolyte (LiCl) into dispersions. Influence of sintering temperature, the milling time and fiber content of ZrO<sub>2</sub> on the structural composition was evaluated by measurement of density and by structural analysis using a scanning electron microscope. Mechanical and bioactive properties of sintered deposits were determined by measuring of Vickers's hardness, fracture toughness and in vitro test in simulated body fluid (SBF), respectively.

**Keywords:** bioceramic composite material electrophoretic deposition

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