

Comparison of HA coatings obtained by hydrothermal method using solution containing (EDTA)²⁻ and Hank's solution on pure Ti and Ti implanted with Ca²⁺

A. Strzala, B. Petelenz, J. Kwiatkowska, and B. Rajchel

Institute of Nuclear Physics, Radzikowskiego 152, 31-342 Kraków, Poland

In order to obtain a biocompatible and bioactive hydroxyapatite (HA) $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ coating, that improves hip joint endoprosthesis integration with bone, hydroxyapatite was formed on pure titanium and Ca^{2+} implanted titanium substrates using hydrothermal method. Titanium is one of the most widely used materials in endoprosthesis fabrication. To synthesize HA two different solutions were used: one containing EDTA^{2-} , calcium and phosphorus ions and the other was Hank's solution whose composition is similar to the human blood plasma. The chemical and molecular composition of as deposited coatings were investigated by RBS method and Raman micro-spectroscopy.

The effectiveness of the solutions in HA forming by the hydrothermal method and the influence of the substrate condition are discussed.