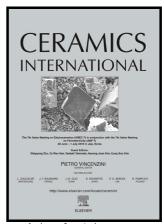
## Author's Accepted Manuscript

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In-situ immobilization of Sr radioactive isotope using nanocrystalline

hydroxyapatite

Marija Prekajski Đorđević<sup>1\*</sup>, Jelena Maletaškić<sup>1</sup>, Nadežda Stanković<sup>1</sup>, Biljana Babić<sup>1</sup>, Katsumi

Yoshida<sup>2</sup>, Toyohiko Yano<sup>2</sup>, Branko Matović<sup>1</sup>

<sup>1</sup>Department of Material Science, Institute of Nuclear Sciences Vinča, University of Belgrade,

Mike Petrovića-Alasa 12-14, 11000 Belgrade, Serbia

<sup>2</sup>Laboratory for Advanced Nuclear Energy, Institute of Innovative Research, Tokyo Institute of

Technology, 2-12-1 Ookayama, Meguro-ku, 152-8550 Tokyo, Japan

Corresponding author: Marija Prekajski Đorđević, prekajski@vinca.rs

**Abstract** 

Hydroxyapatite was used as the inert matrix for in-situ immobilization of stroncium (Sr)

radioactive isotopes at room temperature. A nano-emulsification method was applied to

synthesize Sr-substituted calcium hydroxyapatite (Ca<sub>1-x</sub>Sr<sub>x</sub>)<sub>10</sub>(PO<sub>4</sub>)<sub>6</sub>(OH)<sub>2</sub>. The concentration of

incorporated Sr was in the range of  $0 \le x \le 1$ . Immobilization of Sr was evaluated using a stable

isotope instead of radioactive isotope. The effect of strontium concentration on the crystal

structure was studied and the results have showed that in the whole concentration range, Sr forms

solid solutions with the host hydroxyapatite crystal structure. Powders comprised of nanometre

sized particles were obtained and their properties, such as crystallite and particle size, changes in

lattice parameters as function of dopant content and thermal stability, were further examined. It

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