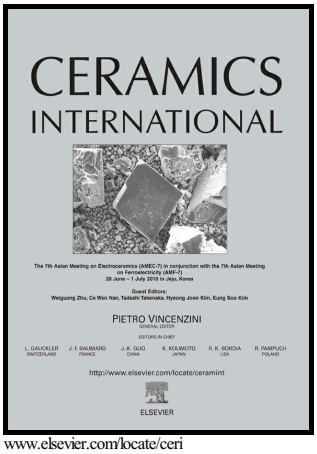

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In-situ immobilization of Sr radioactive isotope using nanocrystalline hydroxyapatite

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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 $(Ca_{1-x}Sr_x)_{10}(PO_4)_6(OH)_2$. The concentration of incorporated Sr was in the range of $0 \leq x \leq 1$. 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