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Materials Science and Engineering

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Design, synthesis and evaluation of non-urea inhibitors of soluble epoxide hydrolase

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Inhibition of soluble epoxide hydrolase (sEH) has been proposed as a new pharmaceutical approach for treating hypertension and vascular inflammation. The most potent sEH inhibitors reported in literature to date are urea derivatives. However, these compounds have limited pharmacokinetic profiles. We investigated non-urea amide derivatives as sEH inhibitors and identified a potent human sEH inhibitor having potency comparable to urea-based inhibitors.

I/2

Synthesis, characterization and sintering properties of Zr-doped hydroxyapatite

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Improving of material characteristics could be achieved in different ways, but it is always connected with the issue of impairing the other functional properties. Hydroxyapatite bioceramics lacks of insufficient mechanical properties for load-bearing implant applications. Nowadays, making of composites, nanostructuring and doping of basic material are some of the promising pathways for hydroxyapatite toughening.

Until now, Zr is not considered as fortifying dopant in hydroxyapatite based materials. However, it could be interesting in the sense of nontoxicity, preserved biocompatibility and incorporation in hydroxyapatite crystal lattice since it possesses lower crystallographic radius.

In this study, preliminary experiments of chemical precipitation are performed to obtain hydroxyapatite with various Zr content. The crystal phase composition, particle size and morphology changes compared to pure hydroxyapatite are studied. Sintering is performed to find appropriate conditions for fabrication of dense material. Vickers hardness and fracture toughness were also measured.