

Synthesis of hydroxyapatite (HAP) using inositol hexakiphosphate (IP6) as both chelating agent and phosphate source

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Hydroxyapatite (HAP) is known as a major component in vertebrate skeletal tissues and teeth. HAP is used in broad range of applications in biomedicine due to its outstanding biocompatibility, bioactivity and nontoxicity. Properties of HAP, such as chemical composition, structure, crystallinity, and morphology, are related to their applications.

One of synthetic method to synthesize and modify HAP is using some organic molecules with phosphate groups ( $-O-PO_3^{2-}$ ) as phosphate ion ( $PO_4^{3-}$ ) source. The molecules can release phosphate ion via hydrothermal treatment. Inositol hexakiphosphate (IP6) is a principle storage of phosphorus in plant. IP6 can bind to various cation ions, including  $Ca^{2+}$ , and form a complex under adequate pH condition.

We develop solvothermal synthetic routes to synthesize HAP with  $Ca^{2+}$  and IP6 through solvothermal method in a mixture of water and ethanol as a solvent, with addition of base to make suitable synthetic system. As-prepared calcium phosphate particles have been characterized by means of various microscopic and spectroscopic tools. We propose the mechanisms of the formation of CaP, and observe the effects of reaction conditions on the products.