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## Synthesis and characterization of low dimensional bioactive monetite by solvent exchange method

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### Abstract

A method is demonstrated to synthesize high purity low-dimensional monetite ( $\text{CaHPO}_4$ , dicalcium phosphate anhydrous) for biomedical applications by solvent exchange in a polar aprotic medium. Stoichiometric aqueous solution containing calcium nitrate and phosphoric acid was prepared and the solvent was exchanged with acetone, thereby to obtain the new phase. The precipitate contained phase-pure monetite particles having 10-20 $\mu\text{m}$  size with burr-like nano surface growth features. The material obtained was found bioactive in immersion test using simulated body fluid and cell compatible in cell adhesion studies using L929 cell lines. It will be ideal for the use in bioceramics and bone cements.

Key words: Bioceramics, biomimetic, Monetite, bioactivity, solvent-exchange.

### 1. Introduction

Monetite is a calcium-releasing edible mineral, which is used widely in food processing industry and in consumable products like tooth pastes [1]. More striking is its application in health care, as bone graft material [2]. As a proven osteoconductive material, monetite is an important ingredient in the production of bioceramics and apatitic bone cements [3]. Many of such products are available in the market for orthopedic and dental applications. Morphology and size of the component particles play crucial role in designing a synthetic bone graft material [4]. High purity monetite for medical application is synthesized through wet chemical process, wherein the crystals have elongated rod like morphology with

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