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Paper ID: 1570942024

Paper Title: Characterization of Fluoride-added Hydroxyapatite Derived from Eggshells for Dental Application

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## Abstract

Hydroxyapatite (HA) is one of the potential biomaterials used for treating dental defects. It can be incorporated with fluoride to enhance its anti-caries properties, though other properties could be dependent on processing technique. Hence, this study aims to characterize the influence of sintering on the properties of fluoride-added HA derived from eggshells. FTIR and XRD techniques are used to characterize the chemical and crystal structures of the samples, whilst dissolution test is carried out to characterize material degradation in the acidic environment. The results show that sintering increased the crystallinity in both HA and fluoride-add HA (F-HA) samples, which corresponds with the enhanced stability during the dissolution test. Moreover, it is also found that the addition of fluoride could further stabilize the material structure, though the impurities found in all the samples still need to be minimized. These findings suggest that sintering and fluoride addition could potentially enhance anti-caries properties of eggshell-derived HA, which could be beneficial for dental application in future subject to further process optimization and analysis.

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