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Fabrication of Nano Reinforced Hydroxyapatite-Zirconia used as Filler in Dental Cement Resin

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Hydroxyapatite (HAp) already well known and has been widely used in the field of medical and dental, such as in bone cement, implant, and alveolar ridge augmentation. HAp [Ca_{10}(PO_4)_{6}(OH)_2] as a bioceramic consisting of calcium phosphate has biocompatible properties to the human body. The aim of this study is to investigate the basic properties of nano reinforced hydroxyapatite-zirconia (HAp-Zr) used as a filler in dental cement resin. The composite HAp-Zr powder was synthesized by co-precipitation method at pH 9.5 and sintered at 900°C. XRD results revealed that the main phase developed were hydroxyapatite and zirconia. SEM morphology of the interface showed no gap between cement and tooth structure. We concluded that the Hap-Zr filler was increased the mismatch degree and mechanical interlocking between dental cement and tooth structure.

Keywords: Hydroxyapatite, zirconia, dental cement, interface