

SYNTHESIS OF HYDROXYAPATITE NANO PARTICLES AND INVESTIGATION OF THEIR MECHANICAL PROPERTIES

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Hydroxyapatite (HA) formulated as $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ has been widely used in medical, dental and other health-related fields as materials for damage bones or teeth, important implant and scaffold materials, as drug delivery agents due to their bioactivity, and ostioconductivity and non-toxicity.

In this research mechanical properties and thermal conductivity of hydroxyapatite were measured. These measurements are extremely important in modeling artificial bones. When hydroxyapatite coated on steel it must be sintered in order to make good attachment on to the steel surface. In this process mechanical and thermal properties will change and it will affect to the implant. Therefore, the variation of the mechanical and thermal properties with the sintering temperature was studied. For this process hydroxyapatite nano particles were used. According to the conclusion, mechanical properties were enhanced with the sintered temperature. This finding was supported by the results from X-ray diffractometry (XRD), Fourier transform infrared spectroscopy (FTIR), readings of Universal testing machine and Scanning differential calorimeter (SDC). The mechanical properties of HA samples such as modulus of rupture (MOR) and young's modulus were investigated for a rectangular bar by four-point bending. As well as designed a sample maker were used to prepare rods for measures thermal conductivity.