

Synthesis and characterization of tricalcium phosphate substituted with magnesium and zinc

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Among calcium phosphate ceramics, tricalcium phosphate ($\text{Ca}_3(\text{PO}_4)_2$, TCP) is one of interesting materials for orthopedic and dental applications due to their excellent biocompatibility and osteointegration properties. According to the sintering temperature, TCP exist in three crystal phases such as β -TCP (below 1125°C), α -TCP (between 1125 and 1430°C), and α' -TCP (above 1430°C). Among these phases, mainly β phase is used as biomedical applications. However, β -TCP has poor mechanical properties due to its insufficient compaction from sintering below the β - to α - transformation temperature (1125°C). Some additives enhance structural stability and consequently improvement of the thermal stability of β -TCP. Spray pyrolysis process has a lot of advantages such as preparation of droplet including homogeneous composition component, pure homogeneity, fast reaction time, and so on.

In this work, β -TCP substituted with magnesium and zinc used as sintering additive was synthesized via spray pyrolysis. Magnesium and zinc was added up to 16mol%. The synthesized particle was investigated using XRD, SEM and TG-DSC.