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Tricalcium Phosphate Composites for Orthopedic applications: Preparation and Characterization

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Abstract: In the current scenario, the requirement for biomaterials is increasing since repair and rejuvenation of the damaged/injured human body parts are increasing due to enhanced life period and medication. In this study composite materials made up of TriCalcium Phosphate (TCP) with the reinforcement of polyglactin and Catgut fibers were produced and characterized. Slip casting route was used to synthesize TCP composites with 2.5 wt% polyglactin and 2.5 wt% catgut fibers along with two more composite samples each containing 5 wt% of polyglactin and catgut reinforcements respectively. Sodium silicate acted as a very good binder thus increasing its tensile strength up to 29 MPa. Drilling on the composites was done to study the machinability and drilling characteristics of the composite to have screws/bolts, when used as a bio implant. In order to ensure bio compatibility of the composite, an artificial body fluid test was done and observed that weight of the samples increased after two days of dipping. Above results showed that this prepared composite may be a viable bio implant material with sufficient strength and hardness with good biocompatibility.

Keywords : Biomaterial, Tri Calcium Phosphate, Polyglactin, Catgut, Slip casting, matrix, reinforcements.