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Synthesis and characterization of spider silk calcite composite

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Biom mineralization is a process in which living organisms form minerals from organic and inorganic components. By its mechanical properties biominerals surpass minerals that spontaneously form without presence of organic molecules. Biomineralization inspired scientists to create new materials via combination of biomolecules and inorganic molecules. There is a growing interest in mimicking biomineralization as a potential route in synthesis building block for bone replacement materials. Spider silk possesses excellent mechanical properties, tenacity and elasticity and it has been used as a template for calcite mineralization to improve load bearing strength of osteoconductive calcite. The samples were obtained by mimicking biomineralization for five days in order to follow formation and growth of calcite on the surface of spider silk. XRD and FTIR spectroscopy were used to observe formation of crystal phase. Microstructure, crystal size and its morphology were studied by means of FESEM.

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