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## HYDROXYAPATITE-CHITOSAN 3D SCAFFOLDS MADE FROM NATURAL AND SUSTAINABLE SOURCES

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The use of natural and sustainable sources in the chemical processes is becoming an issue of increasing importance; in addition to this, often natural materials have features (i.e. structure or morphology) which could lead to enhanced performances. Within this frame, in this work we report about the preparation of hydroxyapatite-chitosan 3D scaffolds made from natural and sustainable sources. Hydroxyapatite (HA) is a calcium phosphate ( $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ ) widely used in biomedicine as bone substitute; in the present work HA was prepared from  $\text{CaCO}_3$  obtained using cork as a template agent. Cork is the bark of the *Quercus suber* L., and it possess a porous honeycomb structure, which was maintained by  $\text{CaCO}_3$ . Chitosan (Cs), on the other hand, is a polysaccharide of natural origin, derived from chitin, which is extracted from the shells of crustaceans, i.e. by-product of the food industry. The 3D scaffolds were prepared with in situ HA formation in a Cs solution, which was successively crosslinked and freeze dried. Their morphology was assessed with Scanning Electron Microscopy (SEM) methodology, and a statistical comparison was performed between Cs and Cs-HA scaffolds (pore size, shape and distribution). Moreover, functional properties such as mechanical behavior, antibacterial activity and cytotoxicity were also assessed. Results showed that these 3D scaffolds have great potential for biomedical use, as biocompatible and antibacterial structures.