SOL–GEL DERIVED BIOCOMPATIBLE GLASSES TOWARDS BONE IMPLANT INTEGRATION

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Over the last decade progress has been reported on the development of novel biocompatible glasses for medical applications, namely in the field of bone implants[1]. Most preparation methods, based upon the synthesis of hydroxyapatite[2], demand annealing at very high temperatures, thus precluding the addition of additives that enhance osseointegration, such as collagen and polysaccharides.

This work reports on the preparation of samples containing calcium carbonate and calcium phosphate, by the sol-gel technique[3] at temperatures well bellow 100º C. These samples display interesting morphological and mechanical properties, such as porosity, Young modulus and compressive strength regarding integration with bone tissue. The control over pore size was also achieved. Each sample was examined by X-ray diffractometry (XRD) and scanning electron microscopy (SEM). The chemical composition of the samples was confirmed by EDX/EMA/XPS. Moreover, incorporation *ab initio* of the solvatrochromic dye Nile red reported on local environments that may determine, to a large extent, the mechanism(s) of interaction between these glasses and *in vivo* systems. Finally, biocompatibility was examined through sample immersion in a simulated body fluid.

References

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