12-007 Development and characterization of new dual setting calcium phosphate cement. in vitro behavior

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Silicon compounds are known as bioactive materials that are able to bond to the living bone tissue by inducing an osteogenic response through the stimulation and activation of osteoblasts. In order to improve the bioactive and mechanical properties of a -Ca3PO4/Na2HPO4 cement, the effect of addition of Ca3SiO5 (Alite) on physical, chemical and mechanical properties after soaking in simulated body fluid (SBF) was study. The morphological and structural changes of the material during immersion were analyzed by X-ray diffraction and Scanning electron microscopy. The results showed that addition of 10% of Alite improved the bioactivity of cement, but suppressed the apatite formation due to the increased of local pH that reaches cytotoxic levels. For these formulations, a dense and homogeneous hydroxiapatite layer was observed at 7d in SBF, despite the 14 days needed for conventional cement. Compressive strength decreased drastically with de addition compared to alite-free cements and do not change with soaking.