

### 10-053

#### **Variations of Qn distribution in bioactive glasses containing strontium oxide and alumina**

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The complexity in designing brand-new compositions as 45S5 Bioglass® is mainly due to the fact the more components you have, the more difficult it is to trace the relationship between composition, structure and bioactivity. Also, the properties of bioactive compositions reflect their ability to release a critical amount of different ions in the surrounding host tissue, creating or not favorable conditions to stimulate cellular processes. Since these properties and process of interaction are directly related to the glass network connectivity, which can be evaluated by Qn distribution and other medium-range structural techniques, the present research studied two series of compositions based on 45S5 however adding amounts of Al<sub>2</sub>O<sub>3</sub> and SrO, to verify the impact of subtle compositional changes in the Qn distribution. The samples were obtained by melting (1500°C) and quenching and characterized by X-ray diffraction (XRD), differential thermal analysis (ATD), Fourier transform infrared (FTIR) and Raman spectroscopy. The initial results indicates that the matrix of typical bioactive phospho-silicate glasses which consists to be mostly Q<sup>2</sup>, with some Q<sup>3</sup>, structures have been maintained in samples containing only SrO (0-2,7%mol). However, the samples containing both Al<sub>2</sub>O<sub>3</sub> (2%mol) and SrO (0-2,7%mol) indicates that the addition of 1%mol SrO there is an increase of Q<sup>2</sup> in detriment of Q<sup>3</sup>, but then when the addition is up to 2,7%mol there is a decrease of Q<sup>2</sup> inversely proportional to Q<sup>3</sup>. Although these changes have been presented, none of the samples of both series presented cytotoxicity. Furthermore, studies on biocompatibility are being conducted to evaluate its impacts on their bioactivity.