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## A novel bioactive glass containing strontium and magnesium with ultra-high crystallization temperature

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### Abstract

Bioactive glasses, and in particular the “gold standard” 45S5 Bioglass® (45S5), are employed in medical practice by virtue of their ability to bond to bone. However, the tendency to crystallize of such systems during thermal treatments, which are necessary in several processing routes, is among the reasons that prevent a broader use of these materials. Here a novel bioglass composition (BGMS10), containing strontium and magnesium and a low content of alkali oxides, is presented. Compared to 45S5, the BGMS10 is characterized by a remarkably higher crystallization temperature (932°C), larger processing window and it can be sintered at lower temperature (737°C), thus maintaining its amorphous nature and pronounced bioactivity, as confirmed by *in vitro* tests. For these reasons, BGMS10 is a great candidate for the realization of specific products which require a thermal treatment, such as scaffolds for bone repair, composites and bioactive coatings.

**Keywords:** Bioactive glass; Magnesium oxide; Strontium oxide; Sintering; Thermal properties; High crystallization temperature.

### 1. Introduction

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