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The effect of magnesium content on *in vitro* bioactivity, biological behavior and antibacterial activity of sol–gel derived 58S bioactive glass

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Abstract:

Bioactive glasses (BGs) have a great potential for bone replacement and regeneration in bone tissue engineering applications. In this research, first, sol–gel derived magnesium substituted 58S BGs (MBGs) series composed of $60\text{SiO}_2\text{-}4\text{P}_2\text{O}_5\text{-(}36\text{-x) CaO- } x\text{MgO}$, ($x= 0; 1; 3; 5; 8$ and 10 mol.%) were synthesized and stabilized at $700\text{ }^\circ\text{C}$ to eliminate the nitrates and prevent the crystallization of MBGs. MgO was substituted for CaO in the BG formula up to 10 mol% and the effect of Mg concentration on *in vitro* bioactivity and cellular properties of the MBGs were investigated by immersing them in simulated body fluid (SBF) followed by structural characterization using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) techniques. The effects Mg on proliferation

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