culture, higher than the other G-GC mixtures (Serrano et al., 2008). The heating capacity of G15-GC85 mixture was assessed in vitro using human osteosarcoma cells (human SaOS-2 osteoblasts) after exposure to alternating magnetic fields (100 kHz, 200 Oe) for different times (Alcaide et al., 2012). Results showed that one session of hyperthermia treatment of 20 min in this magnetic field does not induce significant effects on SaOS-2 cells, whereas two sessions of 40 min each carried out at a time interval of 6 h, produced a drastic reduction in proliferation of these cells and high increase of their apoptosis (Alcaide et al., 2012).

Bretcanu et al. (2005, 2006a) prepared magnetic glass-ceramics by melting coprecipitation-derived raw materials. These glass-ceramics, having the composition in the system SiO_2-Na_2O-CaO-P_2O_5-FeO-Fe_2O_3, contain a unique crystalline phase, magnetite (Fe_3O_4), which forms during cooling from melting temperature (1500 °C). These glass-ceramics would no longer require any heat treatment for crystallization, since the magnetic phase (magnetite) was produced during cooling. These materials formed a hydroxyapatite layer on their surface after 2 weeks of immersion in SBF. Calorimetric measurements using a magnetic field of 40 kA/m and 440 kHz for 2 min showed that the estimated heat generation in distilled water varied between 25 and 65 W/g, depending on the amount of magnetite. Thus, if 1 g of these materials is used inside a similar container with distilled water, after 2 min of exposure to this magnetic field, the water temperature could raise by 35 °C to 93 °C above the initial water temperature (ΔT variation) (Bretcanu et al., 2005, 2006a), due to the heat transfer from the glass-ceramic to water. The melting temperature of these glass-ceramics influences the magnetic properties, and thus the heating effect will vary with the melting temperature (Bretcanu et al., 2006b,c). Adhesion and proliferation studies performed on preconditioned samples (1 week in SBF) using 3T3 murine fibroblasts showed good adhesion and proliferation of these cells on the surface of glass-ceramics after 3 days of incubation (Bretcanu et al., 2017).

Glasses with composition in the system SiO_2-CaO-MgO-P_2O_5-Fe_2O_3-CaF_2 were obtained by melt quenching at 1550 °C for 2 h using SiO_2, $CaCO_3$, MgO, Fe_2O_3, CaF_2, and $NH_4(H_2PO_4)$ (Singh and Srinivasan, 2010a). The glasses were heat treated for crystallization at 1050 °C for 3h. The main crystalline phases identified after heat treatment were hydroxyapatite, magnetite (Fe_3O_4), and wollastonite ($CaSiO_3$). Akermanite ($Ca_2MgSi_2O_7$) was detected in glass-ceramic samples with a high iron oxide content. After 30 days of immersion in SBF, the whole surface of the glass-ceramic samples was covered by apatite. Bioactivity was improved with the increase of the Fe_2O_3 amount (Singh and Srinivasan, 2010a).

Bioactive magnetic glasses in the system SiO_2-CaO-Na_2O-P_2O_5-Fe_2O_3-ZnO were prepared by the melt-quenching technique using SiO_2, Na_2CO_3, ZnO, Fe_2O_3, $CaCO_3$, and $NH_4(H_2PO_4)$ (Singh and Srinivasan, 2010b). The Ca/P and Fe/Zn atomic ratios were maintained at 1.67 and 6.5, respectively. The glasses were then heat treated at 800 °C for 1 h to produce glass-ceramics. The crystalline phases obtained after heat treatment were zinc ferrite ($ZnFe_2O_4$, magnetic