
Interaction of glass-ceramic scaffold with simulated body fluid buffered by BES

Diana Horkavcová*¹, Dana Rohanová¹, Aldo R. Boccaccini², Adam Stříbny¹, and Aleš Helebrant¹

¹University of Chemistry and Technology Prague, Department of Glass and Ceramics; Technická 5, 16628, Czech Republic – Czech Republic

²University of Erlangen-Nuremberg; Institute of Biomaterials; 91058 Erlangen, Germany – Germany

Abstract

Simulated body fluid (SBF) buffered by TRIS is the standard solution (ISO23317) for the evaluation of apatite-forming ability of biomaterials used in *in vitro* test. TRIS buffer speeds up the glass-ceramic dissolution and thus gives the false positive results of an experiment. This work is concerned on the interaction of glass-ceramic scaffolds (Bioglass® derived) with SBF buffered by BES (the other buffer from the Good's buffers family). The *in vitro* test was arranged as "static-dynamic" with daily changed (refreshed) SBF solutions. The pH and Si, Ca and P concentration changes in the SBF leachant were analysed by AAS and UV-VIS. Material was characterized by SEM/EDS, XRD, XRF and BET before and after *in vitro* test. We found that scaffold dissolution was less significant in SBF+BES than in SBF+TRIS (due to Ca ions releasing) and consequently the hydroxyapatite (HAp) growth rate was slower in SBF+BES. Based on these results we can conclude, that the BES affects the glass-ceramic scaffold dissolution less compared with TRIS buffer.

Keywords: glass ceramic scaffold, SBF, in vitro test, hydroxyapatite, buffer BES

*Speaker