

A study of fluoride-containing bioglass system for dental materials derived from clam shell and soda lime silica glass

ABSTRACT

The alumino-silicate-fluoride (ASF) bioglass system with empirical formula $[(45-x)\text{SiO}_2-x\text{CaF}_2-20\text{P}_2\text{O}_5-20\text{Al}_2\text{O}_3-15\text{CaO}]$ where $x = 5, 10, 15,$ and 20 (wt.%) has been synthesised by using conventional melt-quenching method. In this study, soda lime silica (SLS) glass and clam shell (CS) vitreous waste were utilized as a source of silicon dioxide (SiO_2) and calcium oxide (CaO), respectively. The different physical behaviors of ASF bioglass were closely related to the CaF_2 content in each composition. The structural analysis shows the presence of various chemical bonds showing the formation of ASF bioglass. The ASF bioglass has many applications in dental field and efforts to improve its formulation can promise a better future in medical procedures.