عنوان مقاله:

An investigation on Mechanical Properties of Apatite-Wollastonite-Diopside Glass-Ceramics Composites

محل انتشار:

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خلاصه مقاله:

Apatite-wollastonite (A-W)-phlogopite glass-ceramic is considered to be difficult to resorb, but often, it has been incorporated in particulate form to create new bioactive composites for potential maxillofacial applications. With various compositions, the present work has attempted to prepare apatite-wollastonite (A-W)-phlogopite glass ceramic composites, by applying sintering. Here, three-point bending strength was used to characterize the A-W glass-ceramic particles, reinforcing with phlogopite. The effects of phlogopite weight percent on fracture toughness and micro hardness varied between 10 and 50 per cent. For that reason, Young s module was investigated as well. Further, sintering conditions were studied by characterizing linear shrinkage and relative density. Since, it is difficult to acquire high relative density in A-W phlogopite glass ceramics; as a matter of fact the bending strength of composites has been affected. Results show that forsterite phase beside the phlogopite relatively caused maximum hardness of composites and diopside phase that was formed in sintered samples probably increased the bending strength. Considering its mechanical strength and characteristics, the study helps to find the compatibility of apatite-wollastonite (A-W)-phlogopite glass-ceramic for suitable artificial bone substitute.

کلمات کلیدی:

Apatite-wollastonite, Glass-ceramic, Bioactive, Interphase, bonding