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Evaluating morphology and mechanical properties of glass-reinforced natural hydroxyapatite composites

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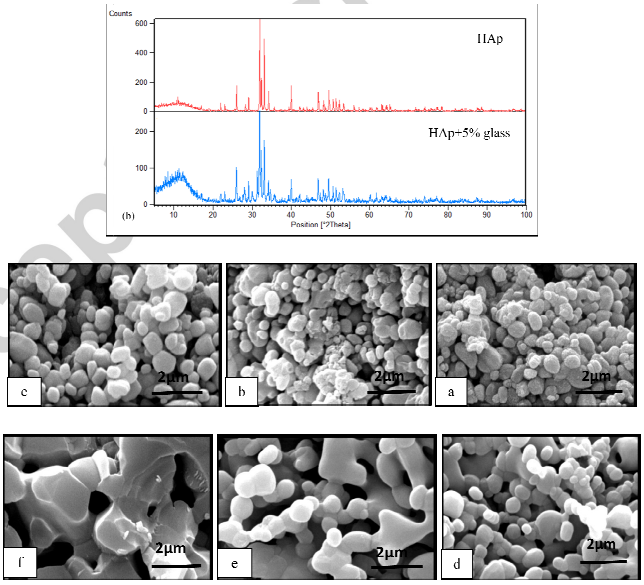
Abstract

Hydroxyapatite has been used in a wide variety of biomedical applications and it can be produced from natural resources such as bovine bone. This material does not have acceptable mechanical properties by itself. In the present work, hydroxyapatite composites with different weight percentages of sodalime glass were made and sintered at different temperatures (800-1200 ° C). Eventually the properties such as density, micro hardness, compressive strength and wear of specimens were evaluated. Specific percentages of glass additive increased the density and hardness of specimens due to increasing the sintering temperature. The hardness and density of specimens were decreased with higher percentage of glass additive. Moreover, the results of compressive test showed that increasing the glass addition increases the compressive performance. Furthermore, the SEM micrographs on worn specimens showed that the mechanism of wear was abrasive.

Graphical abstract



SEM micrographs of 5% glass reinforced-HA_p composites at different sintering temperatures a) 800 ° C, b) 850 ° C ,c) 900 ° C ,d) 1000 ° C ,e) 1100 ° C ,f) 1200 ° C

Key words*: *Composite, Hydroxyapatite, Glass

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