

Production and Mechanical Characterization Hydroxylapatite Based Biocomposite Containing Boron Oxide and Pyrex[®]

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Ceramic, metallic, polymeric and composite materials are generally used as biomaterials for therapeutical purposes. The aim of this study is to prepare and determine mechanical characteristics of the triple ceramic composite containing hydroxylapatite-Pyrex[®] and boron oxide. The limit of boron oxide usage was fixed to 10 wt % in order to avoid cancerous tissues. After grinding and mixing of ceramic powders for a better homogenization using ball milling for 24h, the batches were dried, then powders were pressed to pellets of 1 inch. Subsequently the pellets were sintered at 1000, 1100 and 1200 °C. Following sintering Archimèdes density measurements, SEM, XRD, EDS, DSC-TGA and dilatometric analysis were done. The mechanical properties of the specimens were determined via microhardness and compression testing. The properties of batches were compared with each other and cortical bone to estimate further application of this new biomaterial.

Key words: Bioceramics, Ceramic composites, boron oxide, Pyrex[®]