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Graphene Oxide/Brushite Cement: Promising Composites for Load Bearing Bone Substitutes

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Brushite ($CaHPO_4 \cdot 2H_2O$) cementhas been shown to increase bone mineral density. However, low mechanical properties of the brushite cement under physiological conditions has limited its clinical use.In the present study,(1 gm) of (β-tricalcium phosphate (β-TCP)mixed with different fractions (0.05 and 0.10 Wt. %)of graphene oxidematerials)was reacted with (1 gm) of monocalcium phosphate monohydrate [$Ca(H_2PO_4)_2 \cdot H_2O$, MCPM] in the presence of (1 ml) of water to furnish corresponding graphene oxide/ brushite cement. The microstructure of cement composites wasinvestigated using X-ray diffractometry (XRD) and field emission scanning electron microscopy (SEM). The effect of graphene oxide on the structural and mechanical properties of the brushite cement is clarified. Primary outcomes indicate that the presence of graphene oxide increases the compressive strength of brushite cement, from 6.453 (Pure brushite) to 6.457 (0.05% graphene oxide/brushite cement). Further studies are required to investigate the biological properties of cement composites.

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Biography:

Dr. Ammar Zeidan Ghailan Alshemary is an Assistant Professor in the Biomedical EngineeringDepartment at the Karabuk University. He achieved his PhD in materials chemistry in 2015 at Universiti Teknologi Malaysia, Malaysiaunder the supervision of Prof. Dr Rafaqat Hussain. And then DrAmmar joined Prof. Dr Zafer Evis's lab as a postdoc from 2015 to 2016. After joining the Karabuk University in 2016, DrAmmar works on developing functional and bioactive biodegradable inorganic/organic biomaterial scaffolds and translational research for tissue repair and regeneration, and drug delivery applications.