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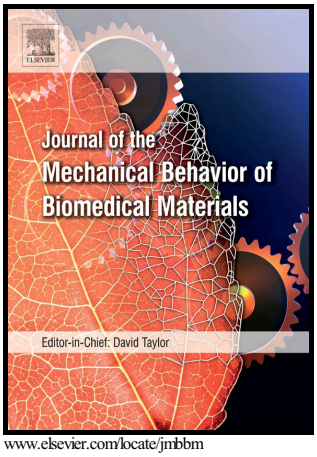


www.elsevier.com/locate/jmbbm

PII: S1751-6161(17)30192-3
DOI: http://dx.doi.org/10.1016/j.jmbbm.2017.05.004
Reference: JMBBM2321

To appear in: *Journal of the Mechanical Behavior of Biomedical Materials*

Received date: 22 February 2017
Revised date: 27 April 2017
Accepted date: 2 May 2017

Cite this article as: Majid Abdellahi, Ali Akbar Najafinejad, Hamid Ghayour Saeed Saber-Samandari and Amirsalar Khandan, Preparing diopside scaffolds via space holder method: Simulation of the compressive strength and porosity *Journal of the Mechanical Behavior of Biomedical Materials* http://dx.doi.org/10.1016/j.jmbbm.2017.05.004

# Preparing diopside scaffolds via space holder method: Simulation of the compressive strength and porosity

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**Abstract**

In the present study, diopside nanopowders were prepared via mechanical milling with eggshell as the calcium source. The space holder method (compaction of ceramic powder and spacer) as one of the most important methods to produce ceramic/metal scaffolds was used to produce diopside scaffolds. For the first time, the effect of the spacer size on mechanical properties and porosity of the obtained scaffolds was experimentally discussed. According to the results obtained, the NaCl particles (as the spacer) with the size of 400-600 μm maintained their original spherical shape during the compaction and sintering processes. As a new work, the most important parameters including the spacer type, spacer concentration, spacer size, and applied pressure were considered, and their effects on mechanical properties and porosity of diopside scaffolds were simulated. Gene Expression Programming (GEP), as one of the most branches of the artificial intelligence, was used for simulation process. By using the GEP, two equations were introduced to predict the compressive strength and porosity of the obtained scaffolds with the lowest error values. The 3D diagrams extracted from the model were used to evaluate the combined effect of the process parameters on the compressive strength and porosity of the