

## CERAMIC COMPOSITE BONE TISSUE SCAFFOLDS

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The repair of broken or diseased bone tissue requires a multitude of strategies ranging from allografts to bone substitutes. Herein we describe a process to create porous all-ceramic scaffolds for bone tissue repair without the need for typical ceramics processing techniques for consolidation (see Figure 1)—a technique that has potential to be used *in situ* in the operating theatre or in the field. The process uses room temperature and pressure to elicit a reaction within a liquid ceramic precursor to form a silicate-glass binder phase to consolidate bioactive glass frit (of the 45S5 composition). Morphological characterization and mechanical response of the composite scaffolds is reviewed paying credence to design specifications required in biomedical implant materials, such as: formability, structural integrity, porosity, load-bearing capability, bioactivity, and resorbability.



Figure 1. The liquid precursor solidifies in air to bind the 45S5 bioactive glass particles together into a rigid compact. (left) Macrophotograph of the porous composite scaffold; (right) back-scattered scanning electron micrograph of the porous composite scaffold.