

Preparation of the PLA foam with dual porosity for scaffold application combined by FDM 3D printing and gas foaming method

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Biodegradable polymer such as Poly(lactic acid) is most widely used in such biomedical applications in tissue engineering. Porous PLA scaffold foam was fabricated by FDM 3D printing and extrusion foaming for biomedical application. It has the benefits of freedom of design, one-step processing, low cost, and dual-pore areas. PLA filament was also blended with a chemical foaming agent for use as a 3D printing raw material. The produced foamable filaments were extruded by 3D print foaming, and a dual-pore scaffold was fabricated via a one step-process combining gas foaming and 3D modeling. Also, the influences of thermal properties and pore morphology were investigated using thermogravimetric analysis (TGA), Differential scanning calorimetry (DSC), scanning electron microscope (SEM) and Hg-porosimeter.