



## Preparation and properties of poly(butylene succinate) porous scaffold by fused deposition modeling and salt leaching techniques

Kasidis Teerasuchai, Bussarin Ksapabutr, Manop Panapoy, and Nattawut Chaiyut\*

Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Sanamchandra Palace Campus, Nakhon Pathom 73000, Thailand

\* Corresponding author: E-mail: [chaiyut\\_n@su.ac.th](mailto:chaiyut_n@su.ac.th)

### Abstract

Scaffolds are a promising innovation that create a suitable environment for the restoration of tissues. They can also be used to achieve efficient drug delivery to specific sites. Poly(butylene succinate) (PBS) is a biocompatible and biodegradable polymer that has been utilized in various research fields. Fused deposition modeling (FDM) was conducted to construct PBS scaffolds with two specific lay-down patterns: grid and triangle. The salt leaching technique was also used to produce pores in the scaffolds. A morphological study, porosity measurement, and contact angle analysis were carried out to characterize scaffold morphology, pore characteristics and surface properties. Salt content and type of lay-down patterns were found to affect the porosity and wettability of the scaffolds. Porosity increased with an increasing proportion of salt while scaffolds with a triangle pattern were more porous than grid pattern at the same salt content. The wettability test showed that the contact angle of all scaffolds ranged between 88° and 102°, while the grid pattern was more hydrophobic than the triangle pattern.

**Keywords:** *fused deposition modeling; poly(butylene succinate); porosity; porous scaffold; salt leaching; wettability.*