Jiachun Feng, Mater Sci Nanotechnol 2018, Volume 2

3D-PRINTABLE SEBS BASED TERNARY BLENDS WITH TUNABLE SHAPE MEMORY EFFECT

Jiachun Feng
Fudan University, China

Heat-activated shape memory polymers (SMPs) have received great attention in both industry as well as academia throughout the last years. Traditional dual SMPs can memorize only one temporary shape, while multiple SMPs can memorize more than one temporary shapes. Unlike the above two categories of SMPs, tunable SMPs are not limited by the number of temporary shapes and have capability to adjust deformation temperatures optionally. Additive manufacturing, also known as three-dimensional (3D) printing, is a remarkable burgeoning technique which drives major innovations in the fields of manufacturing, architecture, healthcare and education. To date, 3D printing with SMPs have attracted lots of interest. In comparison with current 3D-printable dual SMPs or multiple SMPs, 3D-printable tunable SMPs have possibility to implement more complex and sequential shape change process vividly in a pre-programmed way, which is of great significance for applications such as flexible electronics, electrical actuators, intelligent biomedical scaffolds, etc. In this work, we reported a facile strategy to fabricate tunable shape memory polymer blends with the feasibility of 3D printing simultaneously. A series of tunable SMPs consist of styrene-b-(ethylene-co-butylene)-b-styrene (SEBS) ternary blends, exhibiting good dual, triple and quadruple shape memory effect, moreover, such shape memory behaviors can be tuned in a broad temperature range via the selection of deformation temperatures alone, demonstrating that this blend have good tunable shape memory effect. This tunable SMPs are easy to be processed and suitable for a fused deposition modeling 3D printer. Considering the inexpensive and environmental sources as well as easy processing, our reported strategy has great potential in many application fields.

BIOGRAPHY

Jiachun Feng has completed his PhD from Institute of Chemistry, Chinese Academy of Sciences (CAS), China. He is the Professor of Fudan University, China. He has over 100 publications focus on the structure-property relationship and properties improvement of polymer materials.

cfeng@fudan.edu.cn

Note: