Supporting Information

Achieving low electrical percolation threshold and superior mechanical performance in poly(L-lactide)/thermoplastic polyurethane/carbon nanotubes composites via tailoring phase morphology with the aid of stereocomplex crystallites

Zhenwei Liu, Hongwei Bai*, Yuanlin Luo, Qin Zhang, Qiang Fu*

College of Polymer Science and Engineering, State Key Laboratory of Polymer Materials Engineering, Sichuan University, Chengdu 610065, China

*Corresponding author.

Tel./Fax: +86 28 8546 1795. E-mail: bhw_168@163.com, hongweibai@scu.edu.cn (H.W. Bai); qiangfu@scu.edu.cn (Q. Fu).

Detailed fitting procedure used to obtain the parameters of percolation threshold (φ_c), scaling factor (σ_0), and percolation exponent (t) is described as following:

Taking PLLA/TPU-1.5CNTs composites as an example, the experimental data shown in Figure 6 was fitted using the classical percolation scaling law above the φ_c:

$$\sigma = \sigma_0(\varphi - \varphi_c)^t$$

According to the scaling law, we can get one formula:

$$\log\sigma = \log\sigma_0 + t\log(\varphi - \varphi_c)$$

The plot of $\log\sigma$ versus $\log(\varphi - \varphi_c)$ was fitted by varying the value of φ_c from 0.30 wt% to 0.90 wt%. The straight line with φ_c = 0.68 wt% gives the best fit to the experimental data (Figure 6 inset), so the φ_c of the PLLA/TPU-1.5CNTs composites is considered as 0.68 wt%. The slope of the fitted straight line represents the value of t and was estimated to be 2.94. The intercept with the ordinate yields $\log\sigma_0$.

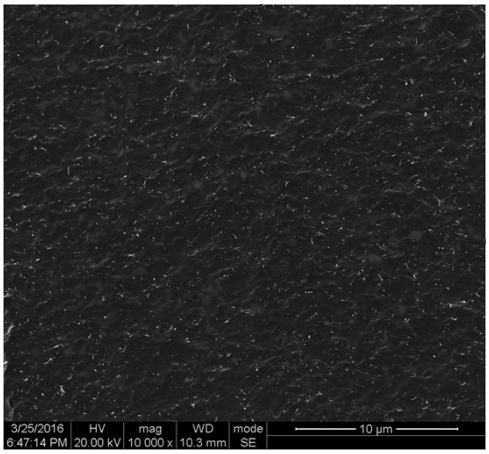

Figure S1. SEM image showing the morphological structure of TPU-1.5CNTs composite.