

Abstract Submitted
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Comparative Study of Silk-Silk Alloy Materials YE XUE, Rowan University; Nanjing University, DAVE JAO, Rowan University, WENBING HU, Nanjing University, NATHAN WOLF, EVA-MARIE ROCKS, XIAO HU, Rowan University — Silk fibroin materials can be used for various kinds of biomedical applications. We report a comparative study of silk-silk blend materials using thermal analysis and infrared spectroscopy. Four groups of silk-silk blend films: Mori-Tussah, Mori-Muga, Mori-Eri and Mori-Thai, were fabricated from aqueous solutions and blended at different weight ratios, respectively. These silk-silk blend systems exploit the beneficial material properties of both silks. DSC and temperature-modulated DSC were used to measure the transition temperatures and heat capacity of these water-based silk-silk blend films. Fourier transform infrared spectrometer was used to characterize secondary structures of silk-silk blends. This study demonstrates that Mori silk are fully miscible with Tussah, Muga, Eri and Thai silk at different weight ratios without phase separation. Glass transition temperatures, degradation temperatures and the contents of alpha-helix and random coils of those silk-silk blend films can be controlled by changing the contents of different silks in the blend system. The features of Mori silk combined with the attributes of Tussah, Muga, Eri and Thai silk offer a useful suite of materials for a variety of applications in the future.

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