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Development of Soft Silk Fibroin Film

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Abstract

Silk fibroin cast film was prepared using a ternary solvent system of $\text{CaCl}_2/\text{CH}_3\text{CH}_2\text{OH}/\text{H}_2\text{O}$ (1/2/8 in mole ratio). A drying temperature at casting influenced crystal structure of fibroin. When a drying temperature was set at 4 centigrade, the cast film became amorphous. When a drying temperature was set higher than 60 centigrade, a fibroin film of silk-II crystal was obtained. A fibroin film of silk-I crystal was obtained in the temperature range from 10 to 50 centigrade. Also, silk-I crystal was generated from random coil through exposure of an amorphous film to water vapor at 20 centigrade. As for the crystal transformation from silk-I into silk-II, the treatment with a glycerol solution was effective. In the course of the treatment a film showed self-thinning and self-expanding. The expansion ratio exceeded 30 % at maximum. The film produced accompanying self-expansion was ductile in nature. L929 cells were cultivated in MEMAM containing extracts from silk fibroin films. The extracts did not inhibit the multiplication of L929 cells.

Keywords

[Silk](#), [Fibroin](#), [Film](#), [Self-expansion](#)

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