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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 $CaCl_2/CH_3CH_2OH/H2O$ (1/2/8 in mole ratio). A drying temperature at casting influenced crysta1 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 crysta1 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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