

Surface Characteristics and Antithrombogenicity of
Regenerated and Graft Copolymerized Silk Fibroin Films

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Silk fibroin was dissolved in calcium chloride/ethanol/water mixture (1/2/8 in mole ratio) at 70°C for 4 hours. The dissolved silk fibroin was regenerated by casting the film from the dialyzed solution. The film were treated with 50% aqueous methanol solution at intervals of various times and their antithrombogenicities were investigated by the method of blood clotting and platelet adhesion tests. The results from the two "in vitro" tests were analyzed in connection with surface characteristics of the film. As the solvent treating time was prolonged, the nondispersion (polar) component of surface tension of the film increased. Antithrombogenicities of the films were mainly affected by the increment of polar component of surface tension ; SFA-15 and SFB-15 having the lowest polar component of surface tension showed better antithrombogenicities than the others. When Kaelble's analysis technique was applied to silk fibroin films, it was found that the blood compatibility of the films increased with the increment of the modified Griffith surface energy, γ_G .

The antithrombogenicity was also examined for the silk fibroin film graft copolymerized with acrylic acid.