

ABSTRACT

This study discusses the fabrication of fiber membranes based on a blend of PVA (Polyvinyl Alcohol) and theaflavin using the electrospinning method, as well as the effect of the annealing process on their mechanical properties for food packaging applications. The PVA–theaflavin blend was chosen because their combination is expected to enhance mechanical strength and thermal stability while providing natural antioxidant properties from theaflavin. A 16% PVA solution was mixed with theaflavin extract obtained through a 24-hour maceration process, then synthesized at a voltage of 21 kV, a flow rate of 2.5 mL/h, a needle length of 1 cm, and a collector distance of 20 cm. The composition ratios of PVA:theaflavin were varied at 9:1, 8:2, and 7:3, followed by annealing treatments at 80 °C, 100 °C, and 120 °C for 20 minutes. FTIR results showed the presence of –OH groups characteristic of the polyphenols in theaflavin. Mechanical tests indicated that before annealing, the optimum tensile strength occurred at a 20% concentration, while after annealing, increasing the temperature tended to reduce tensile strength due to the aggregation of theaflavin. Swelling degree tests showed that the higher the theaflavin concentration, the lower the swelling degree value, both before and after annealing.

Keywords: *Fiber membrane, electrospinning, tensile strength, annealing, swelling degree*