ABSTRACT

The fabrication of Polylactic Acid (PLA)-based membranes was carried out using the electrospinning method. This study aims to determine the mechanical properties of membranes produced with various PLA concentrations through the electrospinning process. The PLA concentrations used were 4%, 4.7%, 5.3%, 6%, and 6.6% (w/w; weight/weight), with a solvent mixture of chloroform ($CHCl_3$) and dichloromethane (CH_2Cl_2) at a ratio of 1:1 (v/v; volume/volume). The electrospinning process was performed at a voltage of 22 kV, with a needle-to-collector distance of 12 cm and a flow rate of 6.67 mL/h. The resulting membranes were characterized through tensile testing to determine the tensile strength, elongation at break, and Young's modulus values. The results showed that variations in PLA concentration significantly affected the mechanical properties of the membranes. At a concentration of 4%, the highest tensile strength of 7.002 MPa and elongation at break of 3.33% were obtained, while the highest Young's modulus of 2.100 MPa was also observed at the same concentration. Increasing the PLA concentration up to 6.6% led to a decrease in mechanical properties, with a tensile strength of 1.59 MPa, elongation of 1.167 %, and Young's modulus of 1.365 MPa. Therefore, a PLA concentration of 4% provides the optimum mechanical properties for electrospun membrane applications.

***Keyword** : Polylactic Acid (PLA), Membrane, Electrospinning, Tensile Strength, Elongation, Young's Modulus.*