EFFECT OF PVA CONCENTRATION AND ULTRASONIC AGITATION TIME ON THE SYNTHESIS AND STABILITY OF PCL/PVA EMULSIONS INTENDED AS RELEASE SYSTEMS FOR BIOACTIVE COMPOUNDS FROM PECAN NUT

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This study explored the potential of poly(ε-caprolactone) (PCL) and poly(vinyl alcohol) (PVA) emulsions as a hybrid polymeric carrier system to encapsulate bioactive compounds from pecan nut for a potential adjuvant delivery system in the treatment of leukemia. For the synthesis, 160 mg of PCL in 10 ml of chloroform were used with two concentrations of PVA (2 mg/mL and 3 mg/mL) and different probing times (1, 5 and 15 min) with agitation and evaporation at 70°C were evaluated to determine their effect on emulsion stability. The results revealed that emulsion stability decreased significantly with increasing PVA concentration, lasting up to one week without phase separation, compared to the 2 days observed with 3 mg/mL PVA. Fourier transform infrared spectroscopy (FTIR) analysis of the precipitated material confirmed the presence of PVA. This suggests that excess PVA may lead to its precipitation during the emulsion preparation process, while SEM images showed particles ranging in size from 300 to 600 nanometers with uniform spherical morphology. These preliminary findings suggest that PCL/PVA emulsions with a PVA concentration of 2 mg/mL and extended probing time could be a promising platform for encapsulation of pecan nut bioactive compounds. The subsequent stages of this research are the evaluation of the encapsulation efficiency of the bioactive compounds within the optimized emulsions and their release in simulated physiological conditions.

Keywords: Hybrid polymeric, Drug delivery system, Emulsion

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