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LOW-COST EXTRACTION PROCESS OF ZEIN FROM CORN GLUTEN MEAL 60 AND ITS ADHESIVES BY CHEMICAL MODIFICATION

Paula Bertolino Sanvezzo¹, Daniela Winsley Valereto Friozi¹, Márcia Cristina Branciforti¹,
Sergio Akinobu Yoshioka²

¹University of São Paulo (*Department of Materials Engineering*) , ²University of São Paulo (*São Carlos Institute of Chemistry*)

e-mail: paula.sanvezzo@usp.br

Adhesives play a vital role in a range of industries, including packaging, construction, and healthcare. However, traditional adhesives often contain harmful chemicals and are not biodegradable, leading to environmental concerns. Zein protein offers a promising solution to these issues due to its unique properties such as biocompatibility, biodegradability, low toxicity, and good adhesive properties. In recent years, researchers have explored the potential of zein protein as a sustainable and eco-friendly alternative to traditional adhesives. Zein protein-based adhesives have shown good adhesion properties on various surfaces such as paper, cardboard, glass, metal, and wood [1,2]. In this study, we used a low-cost scalable process for raw zein extraction from corn gluten meal 60 percent, and developed zein-based adhesives by chemical modification. Zein was characterized by biuret test, TGA, DSC, and UV spectrophotometry (270 nm). Adhesives were prepared by dissolving the raw zein into sodium dodecyl sulfate aqueous solution (200 mmol/L), and treated with two different metal chloride aqueous solutions (FeCl_3 and CaCl_2). Adhesive bond strength was measured in paper card (276 g/m² grammage) using an Instron Universal Test equipment. Results showed good adhesive strength for both metal cations, confirming the potential of zein as an eco-friendly alternative to traditional adhesives.

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References:

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