

# **RHEOLOGICAL BEHAVIOUR AND PHYSICAL PROPERTIES OF PLANT-PROTEIN-BASED BIOPLASTICS**

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Petroleum-based plastics have serious drawbacks, the most important of these is the shortage of oil and the resulting CO<sub>2</sub> emissions. Biodegradable plastics, i.e. bioplastics, are a solution to the problem as they are based on renewable resources and thus CO<sub>2</sub> neutral. Bioplastics have attracted attention for both their industrial, biomedical and pharmaceutical applications.

This work focuses on the development of new bioplastic materials based on proteins from wheat, rice and potato . Bioplastics were obtained by mixing of protein and glycerol and, were subsequently, subjected to thermo-moulding. This work assesses the effect that processing and further thermal treatments exert on the rheological behaviour, thermo-mechanical properties and physical characteristics, through water absorption tests, of the bioplastics obtained. The wheat gluten based bioplastics studied in this work present a high ability for thermosetting modification, due to protein denaturation, that may enhance the development of a wide variety of materials. On the other hand, potato and rice based bioplastics exhibited higher modulus values and lower water absorption capability. . Both hydrophobic and rheological properties turn out to be strongly affected by material formulation and the processing procedure followed.