

**PREPARATION & CHARACTERIZATION OF  
HYDROGEL PECTIN/CHITOSAN/EUTECTIC MIXTURE  
FOR HIGH WATER SORPTION**

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**PREPARATION & CHARACTERIZATION OF HYDROGEL  
PECTIN/CHITOSAN/EUTECTIC MIXTURE FOR HIGH WATER  
SORPTION**

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## **ABSTRACT**

### **PREPARATION & CHARACTERIZATION OF HYDROGEL PECTIN/CHITOSAN/EUTECTIC MIXTURE FOR HIGH WATER SORPTION**

The use of synthetic and toxic materials in the production of hydrogel leads to environmental problems. A biodegradable hydrogel is proposed as a more environmentally friendly alternative. This thesis describes the creation and characterization of pectin-chitosan and DES hydrogels with high water sorption. The hydrogels are fabricated using a solvent casting technique and then characterized using FTIR to identify their functional groups. The water sorption capacity (WAC) was highest in HYD2 with a 10% Choline Chloride: Ethylene Glycol (DES) concentration. The hydrogels' solubility, mechanical strength, and biodegradability were also investigated. Results revealed that increased DES content led to a positive relationship between the hydrogels' solubility, mechanical strength, and biodegradability. Among all the hydrogels, HYD4, with the highest DES content (20 %), exhibited the highest solubility, mechanical support, and biodegradation rate. The results of this study provide valuable information for the design and optimization of hydrogel systems with specific properties, especially in their ability for water sorption application.