Immobilization of Urease from Psophocarpus tetragonolobus L. DC. using Natrium Alginate Supporting Matrix

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Abstract	Urease is an enzyme that has the role to hydrolyzes urea into ammonia and carbon dioxide. Immobilization is one of the most efficient strategies to improve its activity recovery and properties of urease. This research started with the germination of winged beans for 8 days. The winged bean was extracted by grinding using a mortar and pestle and then added with phosphate buffer at pH 7. The solution was homogenized using a stirrer and then centrifuged in cold conditions so that an extract of urease was obtained. Urease extracts were immobilized using a chitosan-supporting matrix. Optimization of the immobilization process of urease extract includes the concentration of chitosan and sodium tripolyphosphate (TPP) and contact time. The obtained was free and immobilized urease activities then tested using the Nessler method and measured using a UV-Vis spectrophotometer with a wavelength of 500 nm. The obtained data were then statistically tested using ANOVA. Urease-chitosan beads were further tested in repeated use and analyzed with SEM-EDX (Scanning Electron Microscopy-Energy Dispersive X-ray). The results showed that the optimum conditions for making urease-chitosan beads were a concentration of 4% (w/v), 2.5% (w/v) TPP, and 60 minutes of contact time, resulting in an activity value of 15.076 U/mL, which can be used 5 times with 46% activity from the initial activity. The EDX analysis results after the addition of the enzyme showed atom composition changes leading to increasing carbon and nitrogen contents. The existence of phosphor showed that TPP was a chitosan cross-link compound. Keywords: Chitosan, immobilization, TPP, urease, winged bean
Publisher Name	Universitas Jenderal Soedirman
Publish Date	2024-03-14
Publish Year	2024
Doi	DOI: 10.20884/1.jm.2024.19.1.7335
Citation	
Source	Molekul
Source Issue	Vol 19 No 1 (2024)
Source Page	8-16
Url	https://jos.unsoed.ac.id/index.php/jm/article/view/7335/5099
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