Immobilization of urease from Phaseolus vulgaris L. seeds using calcium alginate as a support matrix

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Abstract	Urease is an enzyme that functions as a catalyst in the hydrolysis of urea into ammonia and carbon dioxide. The industrial sector has made extensive use of urease. To date, enzymes are used in free form, deemed less effective. Therefore, enzymes are used in immobilized form because they can be utilized repeatedly. This research aimed to isolate urease from kidney bean (Phaseolus vulgaris L.) seed and immobilize it using a Ca-alginate support matrix and a trapping technique. Eight days were devoted to germinating kidney bean seeds to begin the investigation. Isolation of crude urease extract from kidney beans was carried out using phosphate buffer pH 7. It was then immobilized with Ca-alginate at different concentrations of Na-alginate and contact times The crude free and immobilized urease extract was further characterized including pH, temperature and stability of repeated use. The urease activity was determined using the Nessler method using a spectrophotometer. The results demonstrated that urease immobilization from kidney bean seeds with a Ca-alginate matrix was most effective at a concentration of 5% Na-alginate and a contact period of 60 minutes, yielding a value of 5.92 U/mL. The optimal pH of free and immobilized urease was 7 and 8, respectively, and temperatures of 35 and 40 Ã‚Â°C, respectively. The immobilization of urease from kidney bean seeds using a Ca-alginate support matrix increased the stability of recurrent use by fivefold, while the relative urease activity remained at 52%.
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