

Thesis Title Partial Purification of Amylase from Germinated Wheat and Its
Application in the Production of Aroma Fixatives.

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Abstract

Optimal conditions for amylase extraction from germinating wheat grains and partial purification were determined. It was found that extraction by using 0.05 M tris-HCl buffer pH 7.4 containing 0.0005 M CaCl_2 , at 20 grams of the grains per 100-120 ml of the buffer volume and extraction time of 40 minutes was the most suitable extraction condition. After precipitating the amylase in different precipitating agents such as $(\text{NH}_4)_2\text{SO}_4$, acetone, methanol and ethanol, it was found that amylase was recovered by precipitation in ethanol more than any other precipitating agents and had the highest specific activities.

Amylase extracted by tris-HCl buffer and precipitated by ethanol was used for maltodextrins production by single- and dual-stage process. The results showed that physical properties of maltodextrin produced by the optimum conditions of dual-stage process, using 20 % (w/v) starch suspension, 25.0 units of amylase per gram starch for a period of 30 minutes in the first step and using 5.0 units of amylase per gram starch, pH 5.0, at 85 °C for a period of 10 minutes in the second step, were better than that of single- stage maltodextrin.

Encapsulation properties of maltodextrin from single- and dual-stage process were studied. The results revealed that dual-stage maltodextrin gave better citronella oil encapsulated products. Flavor components and their retention in encapsulated products of maltodextrin, β -cyclodextrin, dextrin-10, dextrin-15 and dextrin-20 were studied. By using 1:1 ratio of dextrin and water in freeze-drying encapsulation process, flavor retained in encapsulated products was higher than at other ratios. The results showed that the more the amounts of dextrans used, the higher the quantities of flavor components in the products. The loss of flavor from the products was little when the products were capped and stored at 4°C.