

Thesis Title            Microencapsulation of Vitamin A Palmitate by  
                                 Gelatin-Acacia Complex Coacervation

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### ABSTRACT

A gelatin-acacia complex coacervation system had been evaluated and characterized. The effects of colloid mixing ratio, core to wall ratio, hardening time, amount of hardening agent, concentration of core solution and drying method on the coacervation process and on the properties of the microcapsules were investigated. Microcapsules of vitamin A palmitate were prepared using various weight ratios of gelatin and acacia, i.e. 40:60, 50:50 and 60:40 under control conditions. The other factors were then varied and studied. The studied factors were 1:1, 1:2 and 1:3 core to wall ratios; 30, 60 and 120 minutes of hardening times ; 2, 5 and 10 ml of formaldehyde solution per 280 grams of coacervation system as a hardening agent and 30, 40 and 50 % w/w solution of vitamin A palmitate in corn oil as a core material. The drying methods used were air-drying, hot air and lyophilization.

The results showed that spherical microcapsules were obtained in all cases, except when the hardening time was 30 minutes, which was unable to

obtain the microcapsules. The optimum conditions which provided free-flowing microcapsules and a high percentage of drug entrapped were 50:50 gelatin to acacia ratio, 1:2 core to wall ratio, 60 minutes of hardening time and 2 ml of formaldehyde solution as a hardening agent. When dried by air-drying or lyophilization, the core concentration of 40 % w/w gave the highest percentage of drug entrapped. Additionally, drying the microcapsules by lyophilization gave the best appearance of the products while drying by hot air seemed to give the worst. However, the prepared vitamin A palmitate microcapsules were not stable when they were kept at the room temperature, possibly due to the large increasing in surface area to contact with oxygen and the oxidative decomposition was promoted.