

## Preparation and Characterization of Calcium Alginate Microcapsules by Emulsification-Internal Gelation

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An internal gelation method was proposed in which calcium ions are slowly liberated within the ionic polysaccharide via spontaneous breakdown of gluconolactone, resulting in acidification of an alginate slurry containing a calcium salt. In this work, the calcium alginate microcapsules containing lemon oil were prepared by emulsification-internal gelation, and their potential use as aromatherapy was examined by the controlled release system. The lemon oil encapsulated in the alginate was successfully observed in the Fourier transform (FT-IR) spectroscopy and differential scanning calorimeter (DSC) measurements. Analyses of the diameters and shapes of microcapsules were observed with scanning electron microscopy (SEM). The mean diameters ranging from 4 to 7  $\mu\text{m}$  and encapsulation yield ranging from 50 to 85% were obtained. Also, the controlled release of the lemon oil at 37°C was demonstrated by the infrared moisture determination (IMDB). It was found that the amount of released lemon oil was decreased with increasing the concentration of alginate and  $\text{CaCl}_2$  due to the increase of the cross-linking density of the capsules prepared.