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Oxidation Process of Linoleic Acid Encapsulated with a Polysaccharide by Spray-Drying

Eiichiro ISHIDO[1)], Koichi HAKAMATA[1)], Yasumasa MINEMOTO[2)], Shuji ADACHI[1)] and Ryuichi MATSUNO[1)]

1) Division of Food Science and Biotechnology, Graduate School of Agriculture, Kyoto University
2) Department of Chemical and Biochemical Engineering, Toyama National College of Technology

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The oxidation processes of linoleic acid encapsulated with gum arabic or maltodextrin at various weight ratios by spray-drying were analyzed using the model in which the free energy of activation for the rate constant of the autocatalytic type kinetics was assumed to obey a Gaussian distribution. The model could well express the oxidation processes, and the rate constant corresponding to the mean value of the free energy of activation, k, was greater for linoleic acid encapsulated at the higher weight ratio. Emulsions of linoleic acid and maltodextrin solution with different diameters were spray-dried to prepare the microcapsules. The oxidation processes of linoleic acid within the microcapsules were also calculated using the model. The k value was smaller for the emulsion with a smaller diameter.

Keywords: oxidation, encapsulation, linoleic acid, spray-drying, free energy of activation

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