

PRELIMINARY STUDY ON NIR SPECTRA OF RETROGRADED STARCH

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Retrogradation of starch is one of important quality indexes for food based on starch such as rice. Therefore, in this research, possibility of near infrared spectroscopy to determine the degree of the retrogradation was examined. The degree of the retrogradation was indicated as the degree of geratinization analyzed by BAP(α -amylase-pullulanase) method. 20 samples which have a wide range of the degree of the retrogradation were prepared and the NIR spectra of the samples were measured in reflectance mode with the NIRSystems 6500. In the correlation plots calculated from the 2nd derivative values of the MSC treated spectra and the degree of the geratinization, the major negative peaks of 1544 nm and 2258 nm, and the major positive peaks of 1460 nm, 1602 nm, 1766 nm and 2136 nm could be observed, indicating that NIR absorption at the positive peak wavelengths became strong while the absorption at the negative peak wavelengths became weak as the degree of the retrogradation increased. Because there is negative correlation between the degree of the retrogradation and the degree of the geratinization. As a result of MLR using the 2nd derivative values of the MSC treated spectra and the degree of the geratinization, good calibration equation which include 2258 nm as the first wavelength and 1764 nm as the second one could be obtained, indicating that NIR spectroscopy has a possibility to detect the retrogradation of starch.

In order to find the assignment of the bands observed in the correlation plots, further study may be needed.