

## MEASUREMENT OF THE CONCENTRATIONS OF RAW MATERIAL, SOYA OIL, AND PRODUCT, MANNOSYL ERYTHRITOL LIPID, IN THE FERMENTATION PROCESS USING NEAR-INFRARED SPECTROSCOPY

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Yeast, *Kurtzmanomyces* sp. I-11, produces biosurfactant, mannosyl erythritol lipid (MEL), from soya oil. The properties of biosurfactant MEL include low-toxicity and high biodegradability. MEL provides new possibilities for a wide range of industrial applications, especially food, cosmetic, pharmaceutical fields and chemicals for biotechnology. In the fermentation process, techniques of measuring and controlling substrates and products are important to obtain high productivity with optimum concentrations of substrate and product in the culture broth.

The measurement system for the concentrations of soya oil and MEL in the fermentation process was developed using near-infrared spectroscopy (NIRS). Soya oil and MEL in the culture broth were extracted with ethyl acetate and NIR spectra was carried out between the second derivative NIR spectral data at 1312 and 2040 nm and MEL concentrations obtained using a thin-layer chromatography with a flame-ionization detector (TLC/FID) method. A calibration equation for soya oil was results of the validation of the calibration equation, good agreement was observed between the results of the TLD/FID method and those of the NIRS method for both constituents. NIR method was applied to the measurement of the concentrations of MEL and soya oil in the practical fermentation and good results were obtained. The study indicates that NIRS is a useful method for measurement of the substrate and product in the glycolipid fermentation.