BLACK TEA CLASSIFICATION USING NEAR-INFRARED SPECTROSCOPY

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Abstract
Black tea is one solid product that requires grade determination before it is being marketed. The identification itself is a challenge because the identification must be fast, non-destructive and manageable to large number of batch sample to be determined. This paper addresses the rapid and non-destructive determination model by employing a combination of near infrared spectroscopy (NIRS) techniques with partial least square regression (PLSR) analysis. This model was built using 30 samples from five different grades based on their physical appearance and production methods including BOP, DUST, FANN, FNGS II, PF which all come from varied tea plantations in Indonesia. The use of NIR and PLSR analysis with cross-validation test showed that the five grades were well distinguished based on the optical characteristics in the 4000 – 7000 cm⁻¹ region. This result indicates that the NIRS technique and the PLSR analysis can be used as an alternative way for grade determination of black tea products, rapidly and accurately without damaging the product along the identification process, making it suitable to be applied in tea industry and tea trading.

Keywords: NIRS, PLS, black tea, PLSR