Abstract

In this paper, the modern mathematics statistic methods were applied to research FT-NIR diffuse reflectance spectroscopy analysis. The effects of the distance between the light source/detection probe and the fruit and the influence of the testing position of the fruit on sugar content (SC) prediction performance were also investigated. Diffuse reflectance spectra were measured at different testing distances of 0, 2, 4 and 6 mm for apple sugar content prediction. The statistics analysis results for fruit FT-NIR diffuse reflectance spectroscopy have been obtained employing the variance analysis. The best calibration models for nondestructive predicting the SC of Fuji apples were developed by partial least squares (PLS) technique. The results show that the different distance by 0, 2, 4 or 6 mm has distinctive influence on the performance of calibration models and the best model gave a coefficient determination of 0.8436 and a standard error of prediction (SEP) of 0.773.