

Analysis of some sweeteners and sugars by ATR, NIR and Raman spectroscopy

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Abstract

Sweeteners and sugar alternatives in food technology having been permitted to be used in food and/or beverage products are at limited levels. Nevertheless, it should be noted that synthetic sweeteners like synthetic food additives are xenobiotic substances which are foreign substances to humans¹. The quality control of food and/or beverage products should be analyzed by the manufacturers². In the literature, various methods (chromatographic, electrophoretic, and mass spectrometric methods, *etc.*) were performed for analysis and monitoring the content of sweeteners in food and/or beverage products^{2,3}. However, these methods require expensive equipment, toxic chemicals and long preparation steps. On the other hand, spectroscopic techniques have been widely used for the rapid and sensitive analysis of food and/or beverage products^{4,5}. The aim of the study was to determine the vibrational characteristics of various sweeteners and sugars using attenuated total reflection (ATR), near Infrared (NIR) and Raman spectroscopy. The spectra of various sugars (sucrose, galactose, fructose, glucose) and sweeteners (saccharin, sucralose, neotame, acesulfame K and rebaudioside A) were recorded. The obtained spectral information can serve as reference for the interpretation of spectral studies of various food and/or beverage products containing sugars and/or sweeteners.

Keywords ATR spectroscopy, NIR spectroscopy, Raman spectroscopy, Sweeteners