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Ion Chromatographic Analysis of Monosaccharides and Disaccharides in Raw Sugar

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Abstract

A simple and effective method using ion chromatography was developed for the simultaneous determination of five monosaccharides (arabinose, glucose, fructose, xylose, and ribose) and two disaccharides (sucrose and lactose) in raw sugar samples. The separation was performed on a CarboPac PA 10 column using the gradient elution of sodium hydroxide and water as the mobile phase. Monosaccharides and disaccharides were detected by an integrated pulsed amperometric detection (IPAD) using gold working electrode. Acid hydrolysis was used for sample preparation before the analysis of glucose and fructose. All the studied sugars showed good linear ranges within 0.5–100 $\mu\text{g mL}^{-1}$ with the correlation coefficients higher than 0.997. The limits of detection were all less than 0.5 $\mu\text{g mL}^{-1}$. The RSDs of the method were less than 10 %. The recoveries of the sugars that spiked in raw sugar samples ranged from 96.1 to 102.4 %. The method was successfully applied for the analysis of sugars in raw sugar samples. Sucrose is the major constituent found in the samples at 97 %.

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