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An application of Optical Coherence Tomography (OCT) to measure sucrose concentrations

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This work focused on applying the optical coherence tomography (OCT) technique to measure concentrations of sucrose, one of the most widely used sugars in food industry, in solutions. Because the indices of refraction varied with the amount of sucrose dissolved in the solutions, OCT could be used to quantify the sucrose concentration by measuring the optical path length changes. In addition, near-infrared (NIR) light used in OCT often offered better penetration depths for samples with color or turbidity, enabling the technique to measure the sucrose concentrations even in colored media. Initially, transparent aqueous solutions with various sucrose concentrations were loaded into a flow cell and the optical path lengths of the cell were measured by OCT to obtain calibration curves. After optimizations, the system performances were tested. Finally the system was used to measure sucrose concentration in both transparent and colored liquid samples.

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