

# Applications Note - GPR Refractometer

## Sorbitol (D-Glucitol C<sub>6</sub>H<sub>14</sub>O<sub>6</sub>) in Water

### INTRODUCTION

Within the last ten years, the development of hydrogenated sweeteners has provided considerable benefits for the food processing and soft drinks industries.

Sorbitol is one of the common sugar alcohols and is widely used in soft drinks, confectionery and food products. It is a non-carcinogenic sweetener creating significantly less lactic acid formation than sucrose with the consequent benefit of reduced pH decrease on teeth surfaces. The concentration of sorbitol in water can be accurately and quickly determined using an Index Instruments GPR 12-70 refractometer.

Minimal sample preparation is required and provided the simple steps outlines below are followed, sorbitol concentration accurate to 0.1% is easily monitored.

The GPR 12-70 is accurate to  $\pm 0.0001$  RI making it suitable for either product development or routine quality control work.

### RECOMMENDED EQUIPMENT

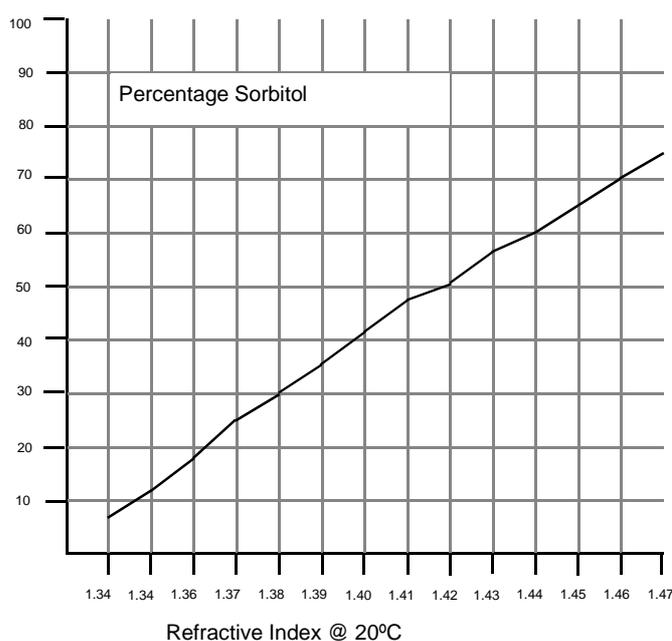
- \* GPR 12-70 Automatic Refractometer
- \* Thermocirculator capable of controlling temperature to  $\pm 0.25^{\circ}\text{C}$
- \* A digital printer or data logging device is only required if you have a large number of samples to measure or need a permanent record of readings

N.B. The use of a suitable flow-cell will considerably improve the efficiency of regular or continuous monitoring of sorbitol concentrations. See operating manuals for details.

### PROCEDURE

- 1) Ensure that the instrument is connected to a suitable power supply and if applicable to printer/.data logging equipment and zeroed as outlined in the instruction manual.
- 2) Thoroughly mix sample to ensure homogeneity.
- 3) If applying sample manually use no more than 0.5 ml. Alternatively, a flow cell system can be used.
- 4) Close sample cover and allow temperature to stabilise. The digital readout continuously displays refractive index and sample temperature. See notes on the next page.
- 5) Wipe sample away with disposable wipe of soft cloth.
- 6) Rinse with distilled water and wipe dry, the instrument is then ready for the next measurement.

*At 20°C, 0.1% Sorbitol  $\hat{=}$  0.0002RI  
Temperature coefficient  $\sim 2.5 \times 10^{-5} / ^{\circ}\text{C}$  and  
70%  
Sorbitol concentration.*



## NOTES

The refractive index (RI) of sorbitol changes rapidly with temperature. The sample solution should therefore be kept at  $20^{\circ}\text{C} \pm 0.25^{\circ}\text{C}$  (or other reference temperature) with the use of a thermocirculator.

A  $1^{\circ}\text{C}$  rise in temperature of a 70% sorbitol solution at  $20^{\circ}\text{C}$  causes a decrease of 0.00025 RI.

To obtain stable results rapidly, the instrument, cell and sample solution should be controlled at the same temperature.

The GPR 12-70 has a built-in temperature corrected refractive index measurement scale which can be used if a thermocirculator or other constant temperature control device is not available. The instrument must be programmed to take account of the sample temperature coefficient. See instruction manual for details.



## HEALTH AND SAFETY

Apart from normal laboratory/production safety precautions, there are no known health and safety hazards associated with using the GPR 12-70 for this analysis procedure, but if in doubt, please contact your Safety Office.

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