

Analyzing Sugars in Foods and Biofuels

Shim-pack™ SUR-Na Columns for Ligand Exchange Chromatography

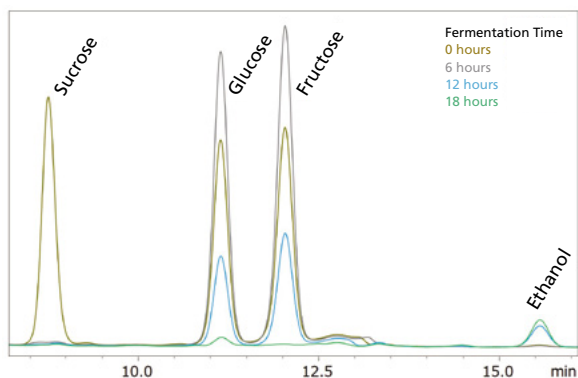
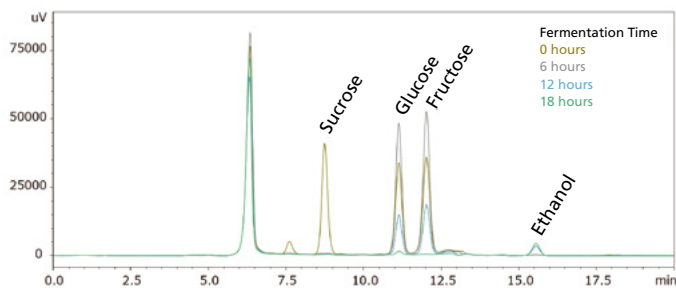
Sugar analysis is commonly conducted in a variety of markets. The ethanol production process in the food and biofuels fields, which utilizes the sugar digestion system of yeast microorganisms, requires measuring and monitoring sugar components and amounts accurately for process design and quality control.

Shim-pack SUR-Na, a ligand exchange chromatography column, offers excellent performance by combining size exclusion mode and sodium-based ligand exchange mode to provide superior separation of sugar components. Pure water can be used for the mobile phase, resulting in less effort to prepare for the analysis.

Alcohol Fermentation Monitoring by Sugar Analysis

With its high performance deriving from the combination of size exclusion and sodium-based ligand exchange modes, monosaccharides, such as glucose and fructose, can be separated, making the Shim-pack SUR-Na column ideal for the process monitoring of ethanol production via fermentation reaction with microorganisms.

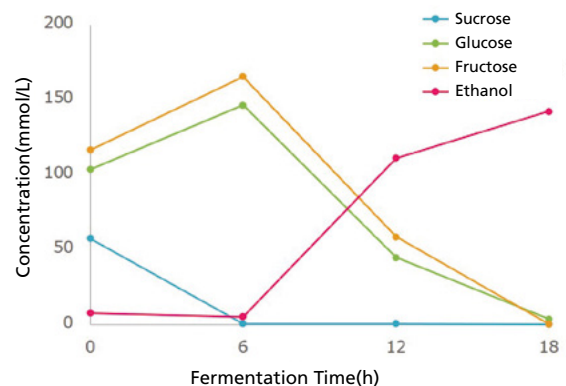
■ Chromatograms of Fermentation Culture Solution
(Upper: Entire Chromatogram; Lower: Enlargement)



■ Analysis Conditions

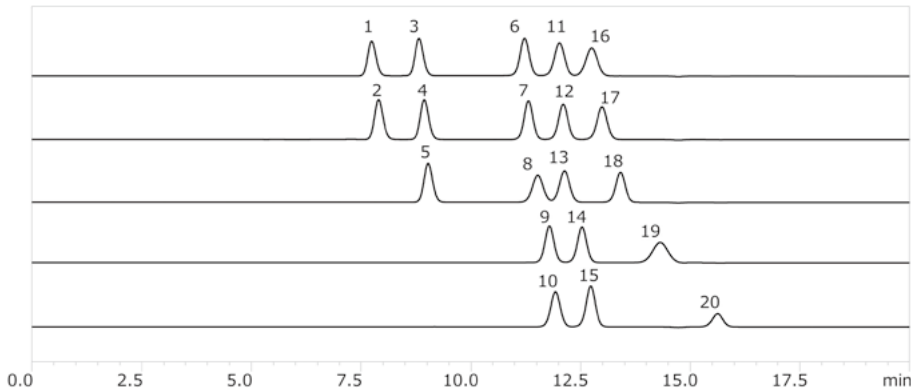
Column : Shim-pack SUR-Na
Guard column : Shim-pack SUR-Na (G)
Mobile phase : Ultrapure water
Column temp. : 80 °C
Detector : RI detector (RID-20A)

■ Fermentation Monitoring Results



Separating Various Sugars

The Shim-pack SUR-Na column has superior separation performance, especially for monosaccharides, sugar alcohols, and some oligosaccharides.



| | | | |
|----|-------------|----|-----------|
| 1 | raffinose | 11 | mannose |
| 2 | maltotriose | 12 | fructose |
| 3 | sucrose | 13 | xylose |
| 4 | maltose | 14 | xylitol |
| 5 | lactose | 15 | inositol |
| 6 | glucose | 16 | fucose |
| 7 | mannitol | 17 | arabinose |
| 8 | rhamnose | 18 | glycerol |
| 9 | sorbitol | 19 | ribose |
| 10 | galactose | 20 | ethanol |

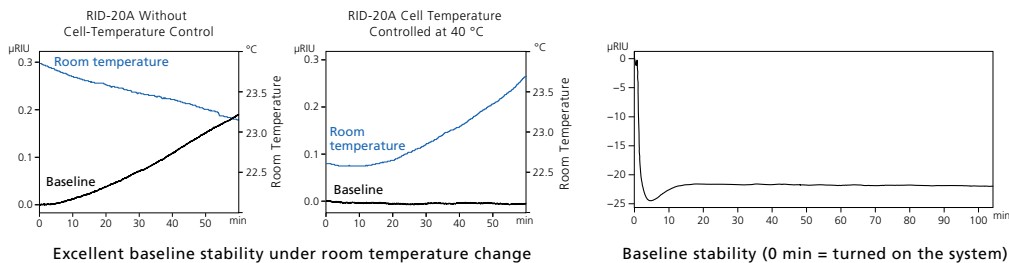
Shim-Pack SUR-Na Column Product Lineup

| P/N | Description | Size | Remarks |
|--------------|----------------------|----------------------|-------------------|
| 228-59529-01 | Shim-pack SUR-Na | 250 mm x 7.8 mm I.D. | Analytical column |
| 228-59529-02 | Shim-pack SUR-Na (G) | 50 mm x 7.8 mm I.D. | Guard column |

Simple and Easy HPLC Setup

The Shim-pack SUR-Na column enables a simple HPLC configuration because the mobile phase is pure water. In addition, Shimadzu's refractive index detector, RID-20A, has a unique temperature control function to obtain a stable baseline eliminating the impact of room temperature fluctuation. The system can start the run earlier (*), leading to maximum analytical efficiency.

(*) compared to the previous model



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