

# Analysis of sugars with small-particle aminopropyl silica column – Reduction of solvent usage and analysis time –

This note describes saving in solvent usage and run time of sugar analysis using aminopropyl silica column.

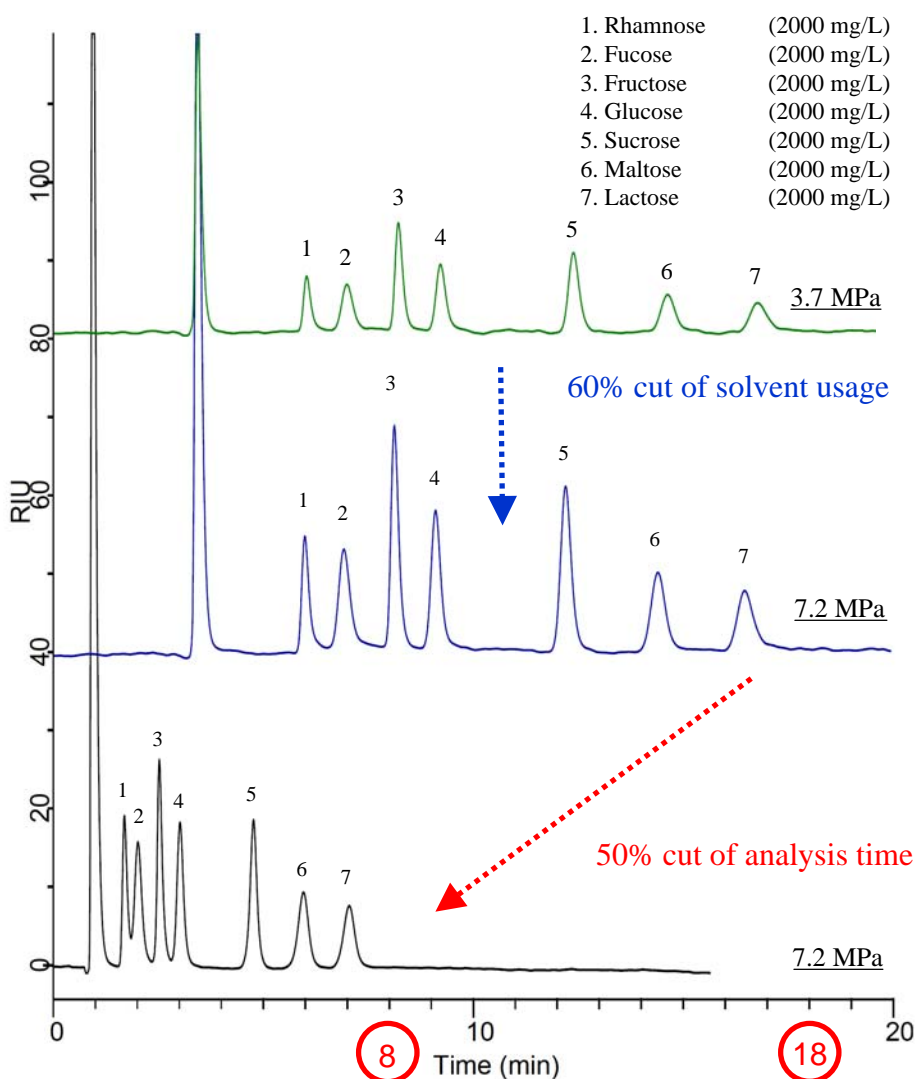
Separation of monosaccharides and disaccharides is often carried out with aminopropyl columns under water-acetonitrile mobile phase conditions. Most of the columns are 4.6 mm inner diameter (I.D.), 250 mm length, and 5  $\mu$  m particle.

Instead of 4.6 mm I.D. column, 3.0 mm I.D. column was

used in this note. As a result, 60% reduction of solvent usage was achieved as well as showing almost the same chromatogram.

Furthermore, 100 mm length and 3  $\mu$  m particle column was utilized. Resolution of rhamnose and fucose was slightly decreased, but the analysis time was shortened from 18 min to 8 min. Even in sugar analysis, short and small particle columns are very useful for rapid assay of many samples. (Y. Tanaka)

## Chromatograms obtained from standard solution



### HPLC condition 1

**System** : GL-7400 HPLC system  
**Column** : Inertsil NH2  
(5  $\mu$  m, 250  $\times$  4.6 mm I.D.)  
**Eluent** : A) CH<sub>3</sub>CN  
B) H<sub>2</sub>O  
A/B = 75/25, v/v  
**Flow rate** : 1.0 mL/min  
**Column Temp.** : 40  $^{\circ}$ C  
**Detection** : RI (40 $^{\circ}$ C, Positive)  
(GL-7454 RI detector)  
**Injection Vol.** : 10  $\mu$ L



Column inner diameter, particle size, and flow rate were changed

### HPLC condition 2

**Column** : Inertsil NH2  
(3  $\mu$  m, 250  $\times$  3.0 mm I.D.)  
**Flow rate** : 0.4 mL/min (\*)  
(The others are the same as condition 1.)



Column length, eluent, and flow rate were changed.

### HPLC condition 3

**Column** : Inertsil NH2  
(3  $\mu$  m, 100  $\times$  3.0 mm I.D.)  
**Eluent** : A) CH<sub>3</sub>CN  
B) H<sub>2</sub>O  
A/B = 80/20, v/v  
**Flow rate** : 0.8 mL/min  
(The others are the same as condition 1.)

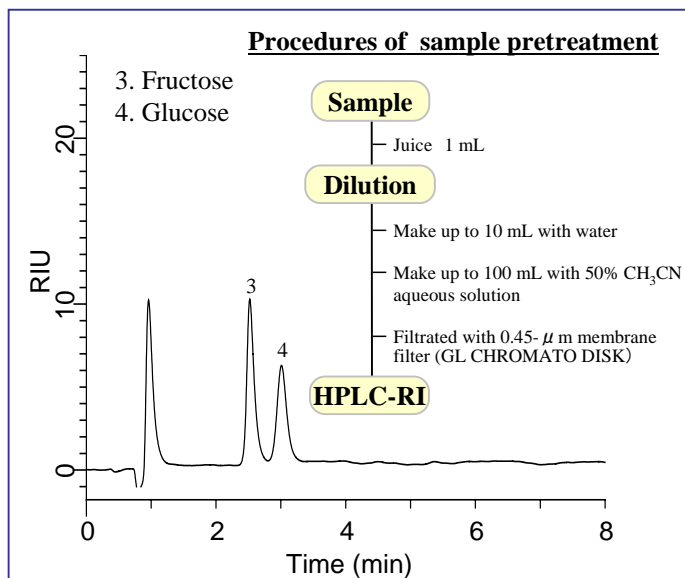
\* See also LC technical note No.87, which describes relation between column inner diameter and flow rate of mobile phase.

Table 1 solvent usage and analysis time under each HPLC condition

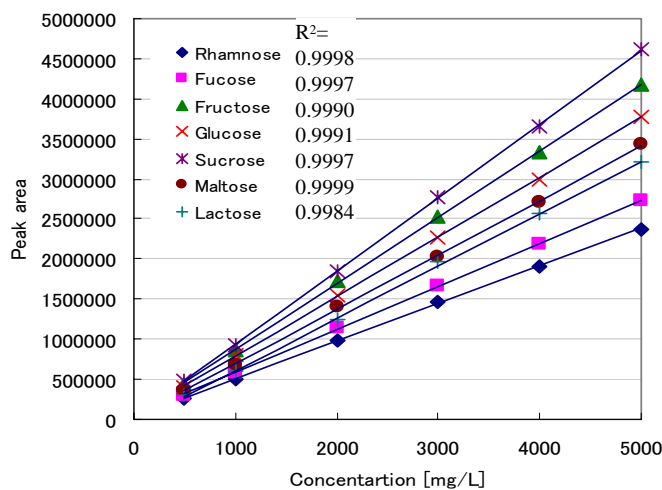
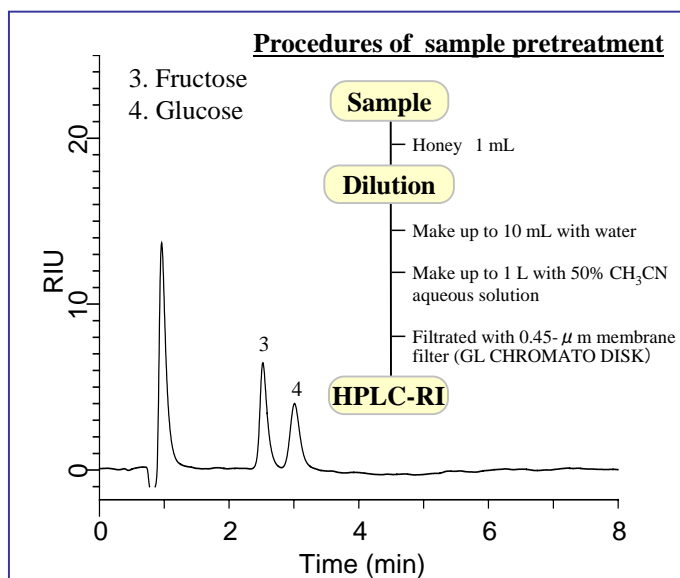
HPLC condition	Condition 1	Condition 2	Condition 3
Analysis time for 1 sample	18 min	18 min	8 min
Solvent usage for 1 sample	18 mL	7.2 mL	6.4 mL
Analysis time for 50 samples	15 h	15 h	6.7 h
Solvent usage for 50 samples	900 mL	360 mL	320 mL
Pressure	3.7 MPa	7.2 MPa	7.2 MPa

## Examples of sugar analysis in food samples (under HPLC condition 3)

### Grape juice



### Honey



The columns used in this note:

- |  |                    |
|--|--------------------|
| Inertsil NH2 (5 $\mu$ m, 250 $\times$ 4.6 mm I.D.) | Cat.No. 5020-05546 |
| Inertsil NH2 (3 $\mu$ m, 150 $\times$ 3.0 mm I.D.) | Cat.No. 5020-05475 |
| Inertsil NH2 (3 $\mu$ m, 100 $\times$ 3.0 mm I.D.) | Cat.No. 5020-05474 |

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