

# Oligosaccharide Analysis on Agilent Hi-Plex Phases

## Application Note

Food

### Authors

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### Introduction

Oligosaccharides are saccharide polymers containing usually three to ten component sugars. Some common oligosaccharides include fructooligosaccharides, found in many vegetables, and galactooligosaccharides, which also occur naturally. These compounds are only partially digestible by humans. However, glucose oligosaccharides, produced by the hydrolysis of starch, are a major energy source.

Oligosaccharides can be analyzed on two Agilent Hi-Plex phases, in order to determine the quantities of each different chain length in the sample. The Agilent Hi-Plex Na, with a crosslinking of 4% and a particle size of 10  $\mu\text{m}$ , can separate oligosaccharides up to Dp 8. Alternatively, the Agilent Hi-Plex Ca (Duo), with an 8% crosslinking, can be used for the faster separation of oligosaccharides up to Dp 5.



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Because the Agilent Hi-Plex Na material has a crosslinking of 4%, it has the largest pore size of the entire range. This, in turn, allows the Hi-Plex Na to resolve the higher oligomers and gives definition in excess of Dp 8 for the oligomers of glucose, as shown in Figure 1.

### Conditions

Column Agilent Hi-Plex Na, 7.7 × 300 mm, 10 μm (p/n PL1171-6140)  
Mobile phase 100% DI H<sub>2</sub>O  
Flow rate 0.4 mL/min  
Temperature 85 °C  
Detector RI

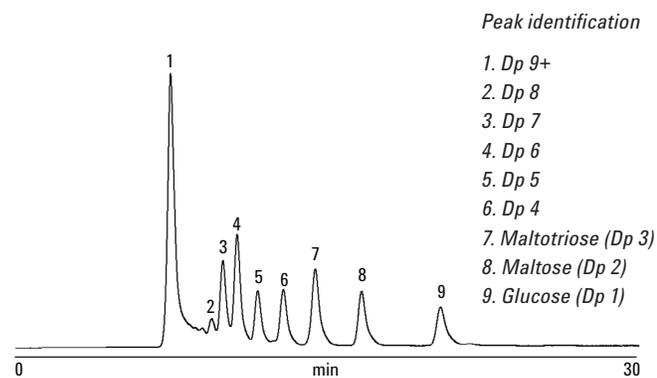


Figure 1. Oligosaccharide separation up to Dp 8 using an Agilent Hi-Plex Na column.

As the Hi-Plex Ca (Duo) is an 8% crosslinked material, its separation mechanism is predominantly size, but the higher crosslinked density reduces the number of oligomers that can be resolved, typically Dp 5 and below.

This material has improved mechanical strength relative to the softer Hi-Plex Na, and its calcium counter ion gives improved ligand-exchange capabilities, per Figure 2.

### Conditions

Column Agilent Hi-Plex Ca (Duo), 6.5 × 300 mm, 8 μm (p/n PL1F70-6850)  
Mobile phase 100% DI H<sub>2</sub>O  
Flow rate 0.5 mL/min  
Temperature 90 °C  
Detector RI

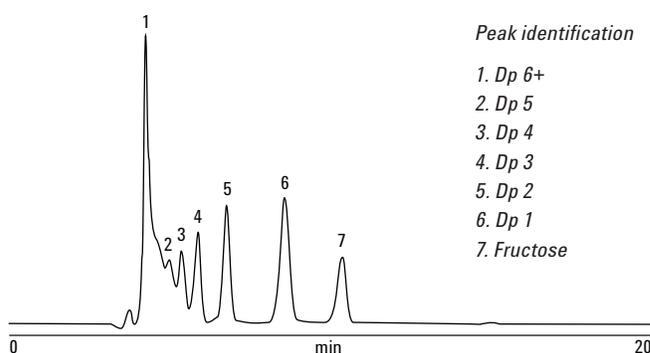


Figure 2. Oligosaccharide separation up to Dp 5 using an Agilent Hi-Plex Ca (Duo) column.

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