Analysis of Inositol in Health Drinks

Inositol (cyclohexane-1,2,3,4,5,6-hexol) has a structure in which one hydrogen atom in each of the positions on cyclohexane has been substituted with a hydroxyl group. Inositol is present in a wide range of foods, including sugars and beans, fruits, and meat. Because it facilitates the smooth metabolism of cholesterol and fats through the body, and also because of its effects on arteriosclerosis and fatty liver, it is referred to as a lipotropic vitamin, and is blended into various nutritional drinks.

Analysis of inositol is possible by GC, but requires derivatization. It is more common to analyze inositol by HPLC, using ion exchange columns. More recently, hydrophilic interaction liquid chromatography or HILIC, has been proposed for analyzing inositol in health drinks.

This technical note describes the analysis of inositol using a 3 micron TSKgel Amide-80 column under gradient elution conditions. When acetonitrile was used as the solvent and the column temperature was set to 40°C as described in Table 1, inositol could not be adequately separated from contaminants in some health drinks. After further investigation of the elution conditions and the role of column temperature, it was found that changing the organic solvent from acetonitrile to acetone and decreasing the column temperature to 15°C resulted in adequate separation of inositol from contaminants (see Table 2). Assays of commercial health drinks produced results that were the same or close to the label claims.

Table 1. Analytical conditions A

Column:	**TSKgel Amide-80, 3µm, 4.6mm ID x 15cm**
Mobile phase:	A: 0.1 % formic acid in water
	B: 0.1 % formic acid in acetonitrile
Gradient:	0 min (95%B) → 20min (50%B) → 22min (50%B) → 24min (95%B)
Flow rate:	1.0mL/min
Detection:	ELSD (Sedere)
	Temp.: 40°C; Nebulizer gas: N_2; Gas pressure: 360kPa; Gain: 4
Temperature:	40°C
Injection vol.:	10µL

Figure 1. Chromatogram of health drinks using analytical conditions A (Health drinks were diluted 2.5-fold using a mixture of eluents A/B (2/8)

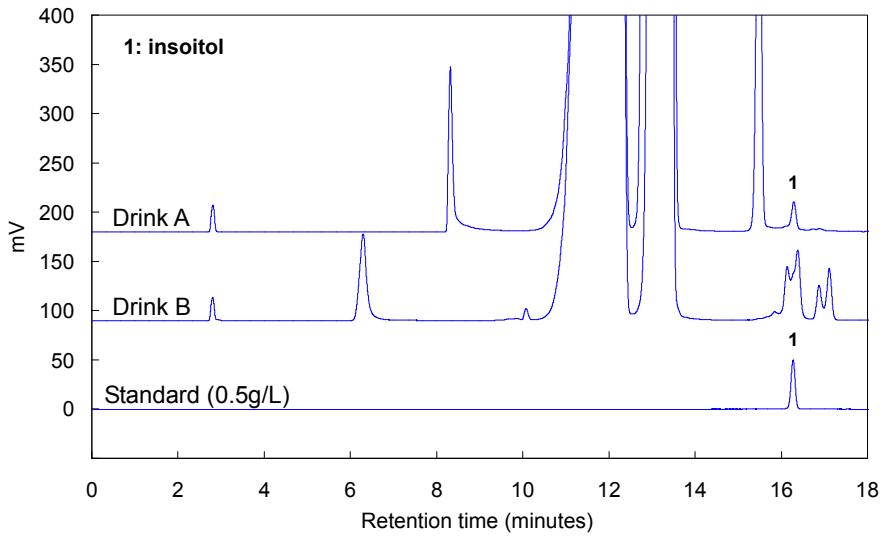


Table 2. Analytical conditions B

Column:	**TSKgel Amide-80, 3µm, 4.6mm ID x 15cm**
Mobile phase:	A: 0.1 % formic acid in water
	B: 0.1 % formic acid in acetone
Gradient:	0min (95%B)→20min (50%B)→22min (50%B)→24min (95%B)
Flow rate:	1.0mL/min
Detection:	ELSD (Sedere)
	Temp.: 40°C; Nebulizer gas: N_2; Gas pressure: 360kPa; Gain: 4
Temperature:	15°C
Injection vol.:	10µL

Figure 2. Chromatogram of health drinks using analytical conditions B (Health drinks were diluted 2.5-fold using a mixture of eluents A/B (2/8)

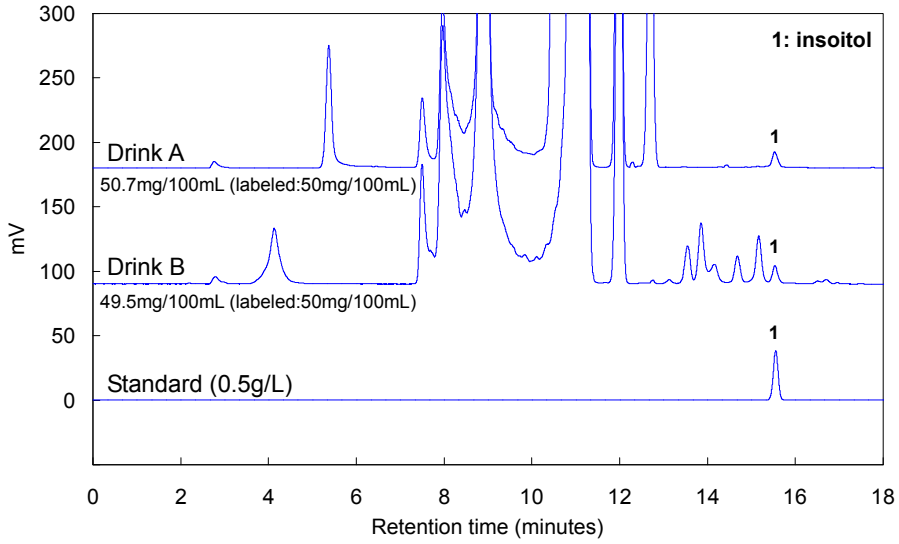
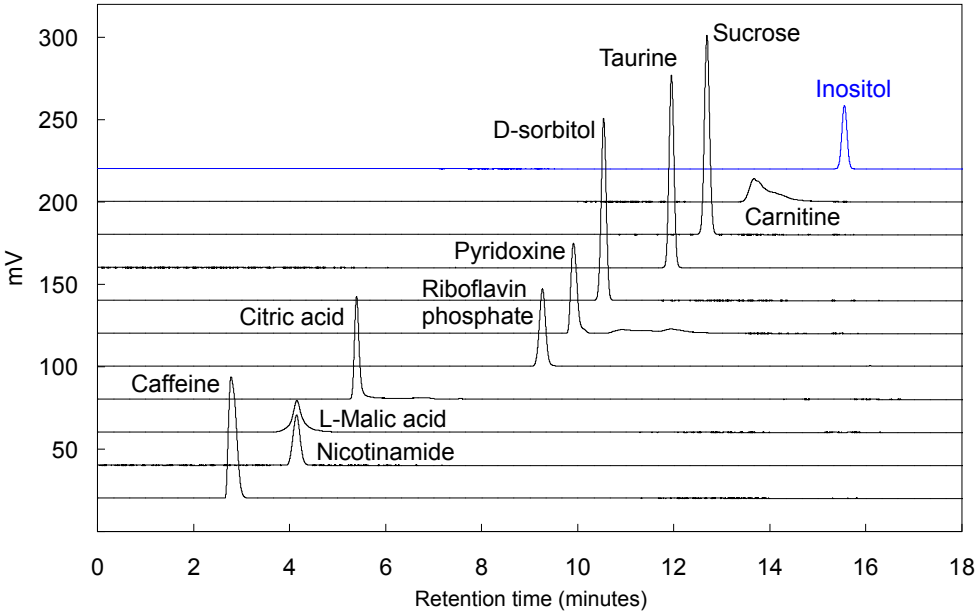


Figure 3. Separation of various components present in health drink using analytical conditions B



TOSOH BIOSCIENCE

TOSOH Bioscience LLC
3604 Horizon Drive, Suite 100
King of Prussia, PA 19406
Orders & Service: (800) 366-4875
Fax: (610) 272-3028
www.separations.us.tosohbioscience.com
email: info.tbl@tosoh.com