Application Note

610061H

Analysis of Cyclodextrines by High Performance Liquid Chromatography with Evaporative Light Scattering Detection

Introduction

Evaporative Light Scattering Detector (ELSD) is an universal detector for HPLC which detects the scattered light from the particles when illuminated of the involatile substance remained, after the sample is sprayed together with N_2 gas after the elution from column and heated to evaporate the mobile phase. LED is used as a light source to illuminate the involatile particles, and the light scattered will be collected and converted into the electronic signal by photomultiplier tube. Samples, such as sugar and fat being generally detected by UV absorption at short wavelength, or by using RI detector so far, can be measured with high sensitivity and stable baseline by using ELSD. Cyclodextrine is known as the oligosaccharide with its glucoses being connected in circle. Cyclodextrine is further named as α-Cyclodextrine, β-Cyclodextrine and γ-Cyclodextrine for the cases that the number of glucoses becomes 6, 7, or 8. Since the property and the performance are different according to the number of glucoses, the amount of these cyclodextrines will influence the taste of food.

This report describes the analysis of cyclodextrine by using ELSD, polymer NH_2 column in HILIC mode.

Keyword : Cyclodextrine, HILIC, polymer NH_2 column, ELSD

Experimental

Equipment		Conditions	
Pump:	PU-2089	Column:	Shodex Asahipak NH2P-50 4E (4.6 mmID x 250 mmL)
Autosampler:	AS-2057	Eluent:	Water/Acetonitrile (40/60)
Column oven:	CO-2060	Flow rate:	1.0 mL/min
Detector:	ELS-2040	Column temp.:	50ºC
		ELSD condition:	Nebulizer temp.: 30ºC
			Evaporator temp.: 30ºC
			Gas flow rate; 1.4 SLM
		Injection volume:	10 µL
		Standard sample:	α, β, γ- Cyclodextrine 0.5 mg/mL each in Water/Acetonitrile (40/60)

Result

Fig. 1 shows the chromatogram of α, β, γ-Cyclodextrine, which were separated and detected properly.

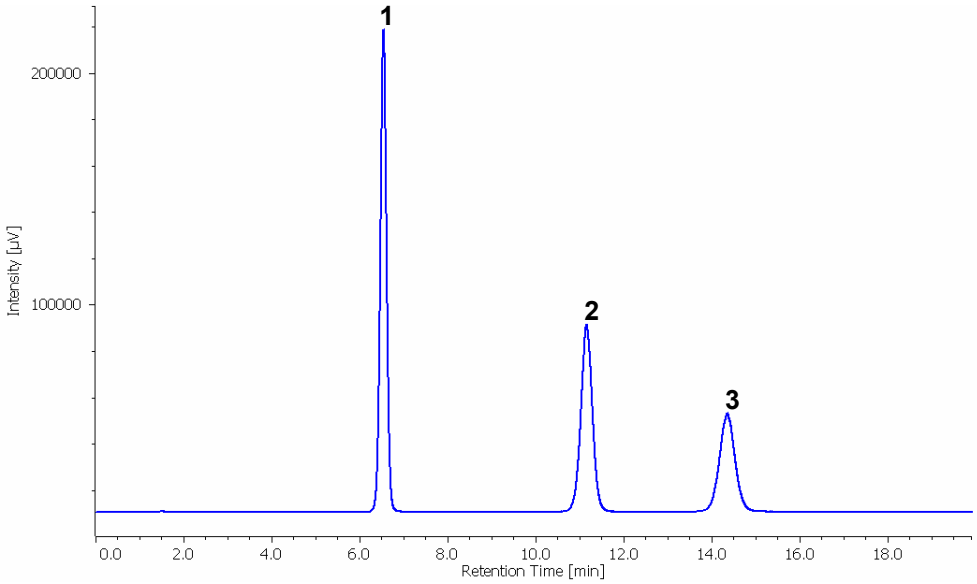

Fig. 1. Chromatogram of the Standard mixture of Cyclodextrine
1: α-Cyclodextrine , 2: γ-Cyclodextrine , 3: β-Cyclodextrine

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Fig. 2 shows the chromatogram of green tea mixed with cyclodextrine. All the components were detected properly with the quantitative result : α-Cyclodextrine 4.5 mg/10mL, β-Cyclodextrine 5.0 mg/10mL, γ-Cyclodextrine 22.7 mg/10mL.

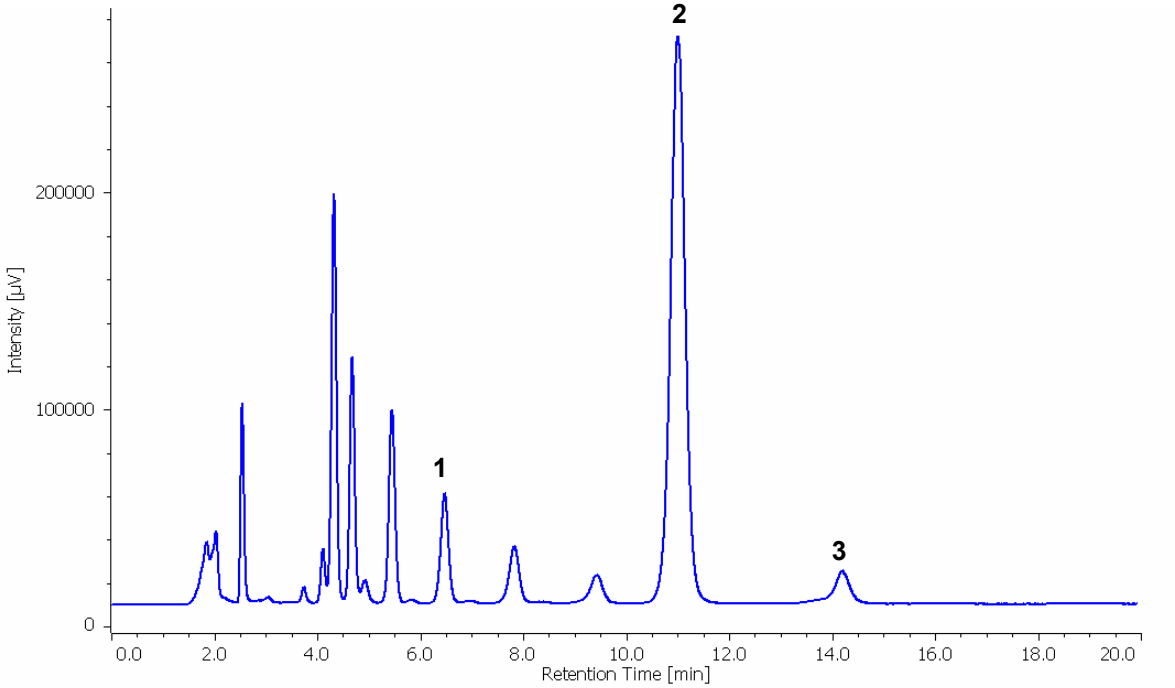

Fig. 2. Chromatogram of green tea mixed with cyclodextrine
1: α-Cyclodextrine , 2: γ-Cyclodextrine , 3: β-Cyclodextrine
Sample preparation: Green tea combined with cyclodextrine was mixed with mobile phase of the same amount, which was then filtrated by the membrane filter of 0.45μm.

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