

Analysis of Cyclodextrines in Green Tea using HPLC-ELSD

Introduction

Surfactants are well known as a main constituent of commercial detergent and is widely used in various industrial and pharmaceutical fields due to various capabilities such as washing performance, moisture absorbency, osmosis, solubility, dispersibility, lubricity, antistatic ability, bactericidal property and anti-rust property. Nonionic surfactants have hydrophilic groups which are not ionized even when dissolved in water. Since it is hardly affected by water hardness and electrolytes, it can be used together with all other surfactants. Considering its nature, the usage of nonionic surfactants have increased dramatically and its affect on the environment has been pointed out. Since 2003, nonionic surfactants have been the test item for Water Quality Control Standards. This time, Triton X-100 and Polyethylene Glycol 400 as nonionic surfactant samples were measured and analyzed using an ELSD detector with Silica NH₂ column in HILIC mode.

Keyword : Cyclodextrine, HILIC, polymer NH₂ column, ELSD, a-Cyclodextrine, b-Cyclodextrine, g-Cyclodextrine



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Experimental Equipment:

| | |
|--------------|----------|
| Pump: | PU-2089 |
| Autosampler: | AS-2057 |
| Column oven: | CO-2060 |
| Detector: | ELS-2040 |

Conditions:

| | |
|-------------------|---|
| Column: | Shodex Asahipak NH2P-50 4E (4.6 mmID x 250 mmL) |
| Eluent: | Water/Acetonitrile (40/60) |
| Column temp.: | 50°C |
| ELSD condition: | Nebulizer temp.: 30°C Evaporator temp.: 30°C Gas flow rate; 1.4 SLM |
| Injection volume: | 10 µL |
| Standard sample: | a, b, g- Cyclodextrine 0.5 mg/mL each in Water/Acetonitrile (40/60) |

Results and Discussion

Figure 1 shows the chromatogram of a, b, g-Cyclodextrine.

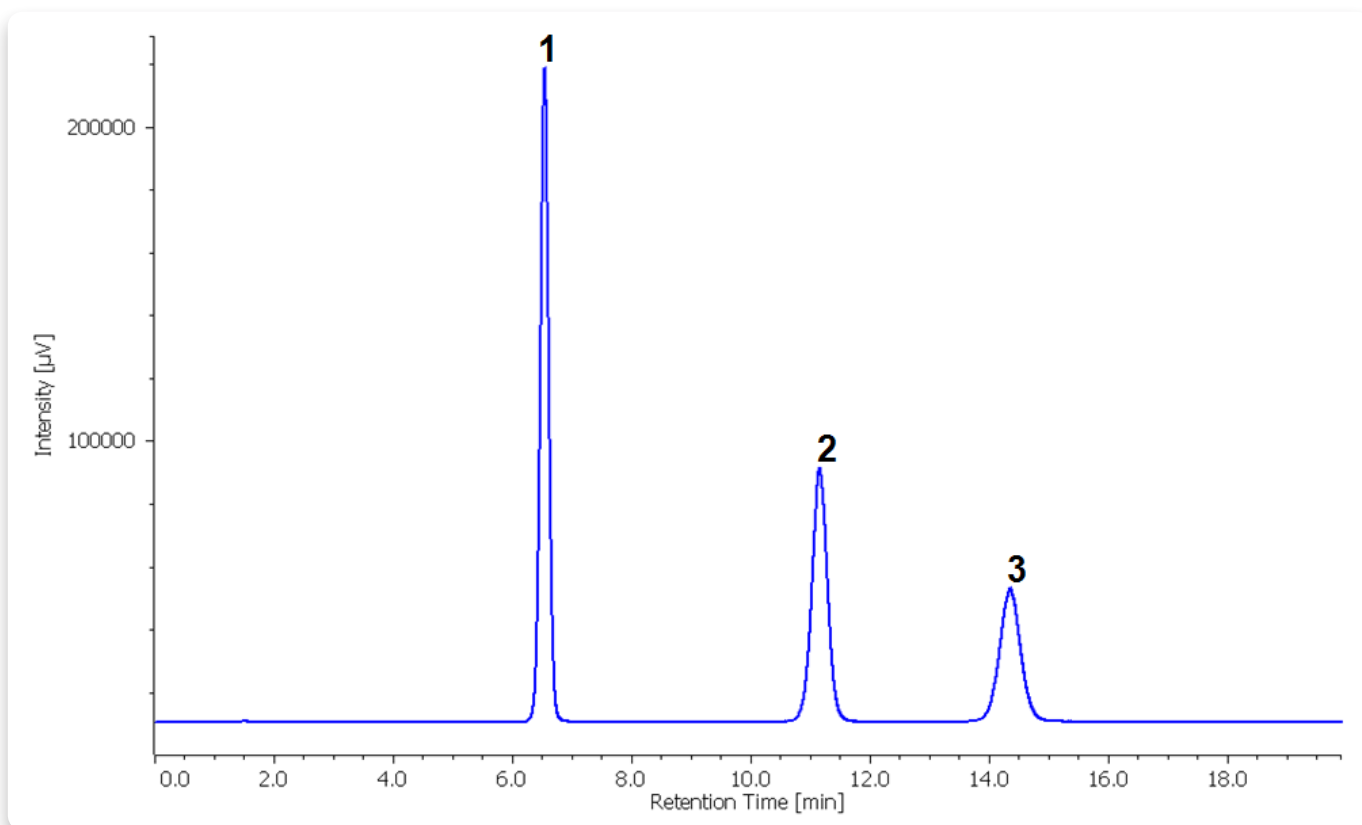


Figure 1. Chromatogram of the standard mixture of Cyclodextrine 1: a-Cyclodextrine , 2: g-Cyclodextrine , 3: b-Cyclodextrine

Figure 2 shows the chromatogram of green tea mixed with cyclodextrine. All the components were detected with the quantitative result : a-Cyclodextrine 4.5 mg/10mL, b-Cyclodextrine 5.0 mg/10mL, g-Cyclodextrine 22.7 mg/10mL.

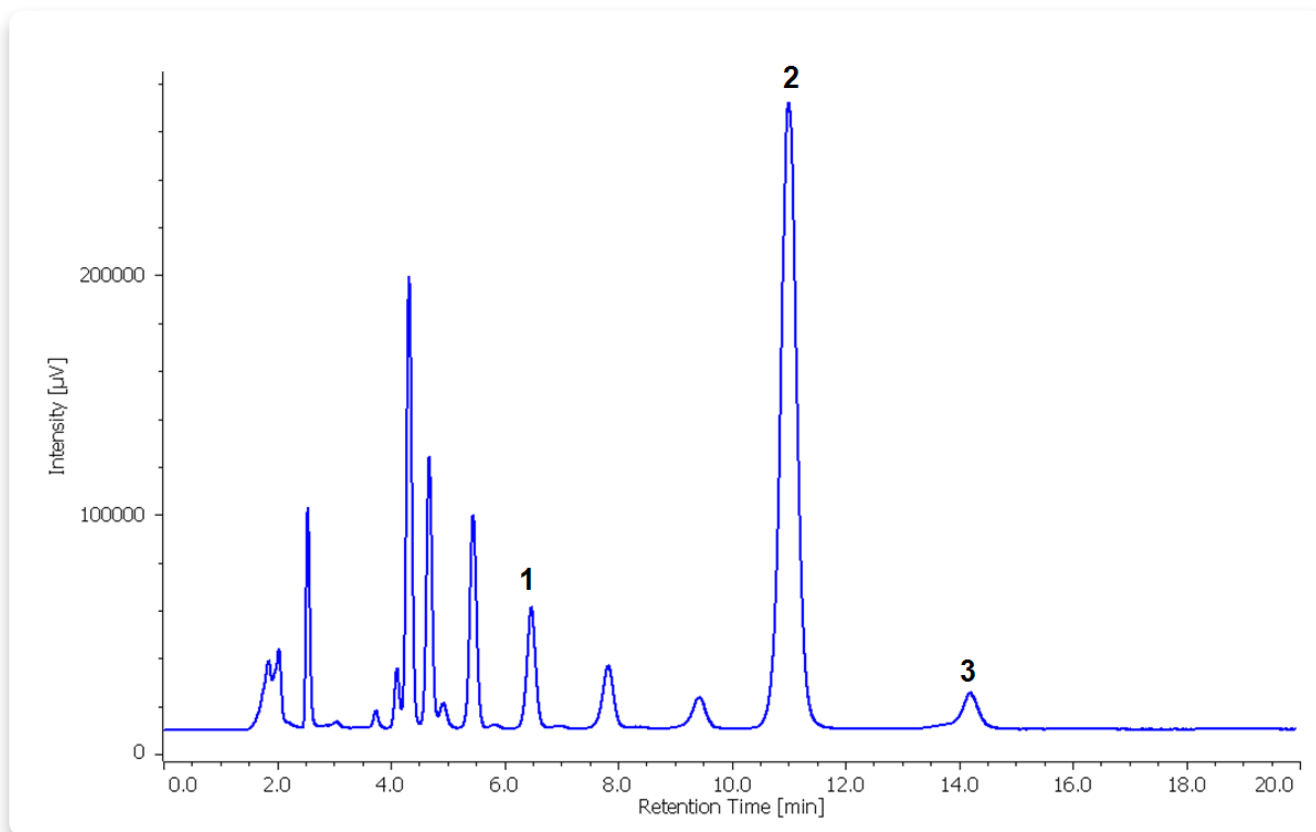


Figure 2. Chromatogram of green tea mixed with cyclodextrine 1: a-Cyclodextrine , 2: g-Cyclodextrine , 3: b-Cyclodextrine, Sample preparation: Green tea combined with cyclodextrine was mixed with mobile phase of the same amount and was then sent through a 0.45µm filter.