



## Simultaneous Analysis of Phenoxyethanol and Parabens

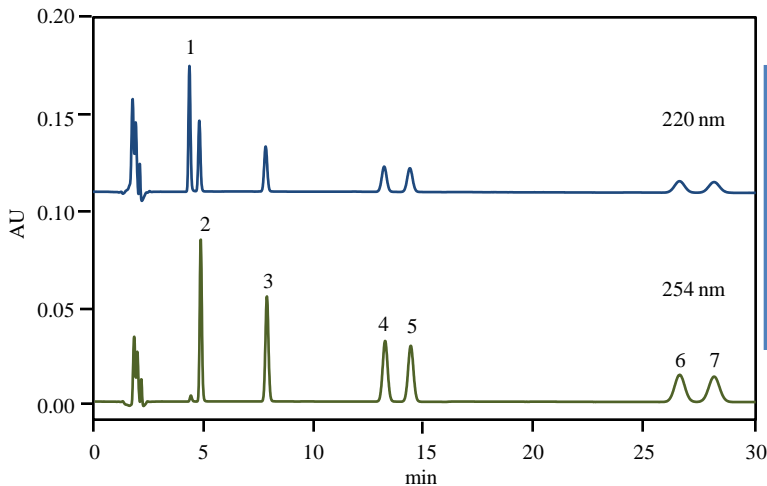
Paraben is a generic term for *p*-hydroxybenzoate esters. Due to their low toxicity in the human body, as well as antiseptic and mold proofing effects, parabens are used as preservatives in medicines, cosmetics, and foods.

Phenoxyethanol is another component used as a germicide and antiseptic in cosmetics. It is a naturally-occurring compound that is found in substances such as green tea.

Phenoxyethanol is often used in combination with parabens in cosmetics to reduce the added paraben content.

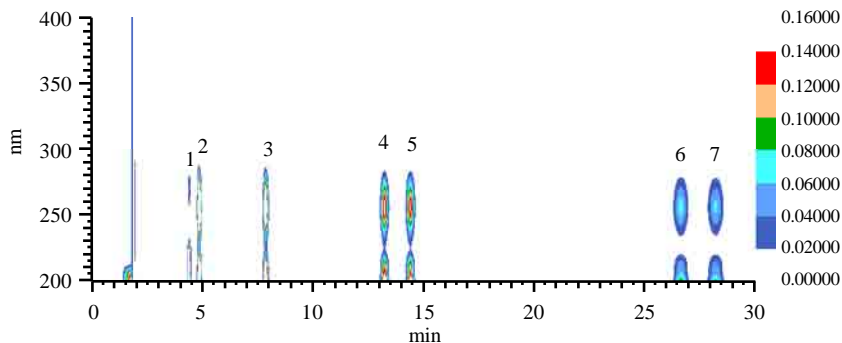
In this presentation, we will introduce and examine the simultaneous analysis of phenoxyethanol and parabens.

### Measurement examples for standard samples



#### [Analytical conditions]

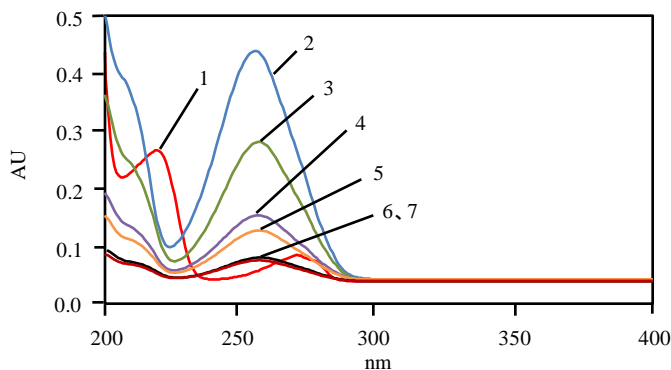
Column : HITACHI LaChrom C18 (5  $\mu$ m)  
4.6 mm I.D.  $\times$  150 mm  
Eluent : CH<sub>3</sub>CN / 0.1% H<sub>3</sub>PO<sub>4</sub>\* (v/v) = 35 / 65 (v/v)  
Flow rate : 1.0 mL/min  
Column temp. : 40  $^{\circ}$ C  
Detection : DAD 220, 254 nm  
Injection vol. : 10  $\mu$ L  
\* : H<sub>3</sub>PO<sub>4</sub> is of a special grade (85.0 %)



[Contour plot and extraction chromatogram]

#### [Standard Samples]

- (1) 2-Phenoxyethanol
  - (2) Methyl *p*-hydroxybenzoate
  - (3) Ethyl *p*-hydroxybenzoate
  - (4) Isopropyl *p*-hydroxybenzoate
  - (5) Propyl *p*-hydroxybenzoate
  - (6) Isobutyl *p*-hydroxybenzoate
  - (7) Butyl *p*-hydroxybenzoate
- 10 mg/L each (prepared with methanol)



[Absorption spectra of the standard samples]

The measurement results from the diode array detector show that 2-phenoxyethanol and the parabens have optimum detection wavelengths at 220 nm and 254 nm, respectively. Accordingly, the following samples were measured with the diode array detector, and chromatograms at these optimum wavelengths were obtained.

### Linearity

Fair linearity was obtained for each sample, with  $r^2 = 1.000$  in the 0.1 - 50 mg/L concentration range.



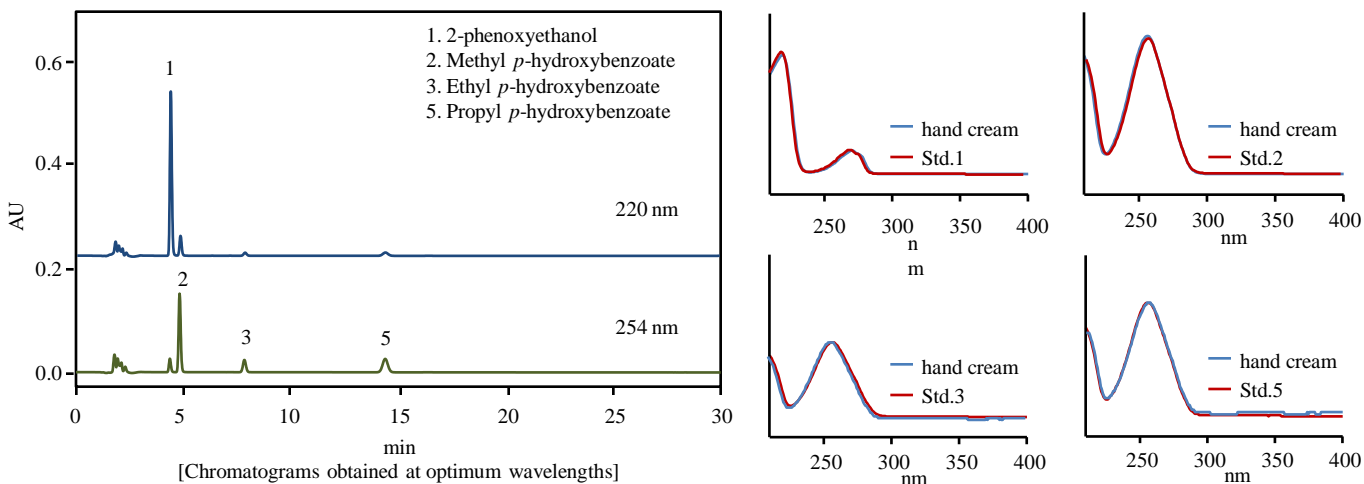
## Simultaneous Analysis of Phenoxyethanol and Parabens

### ■ Analysis example of standard samples

#### Commercial hand cream

[Pretreatment method of the samples]

0.1 g of sample was diluted to 10 mL with methanol and filtered with a 0.2  $\mu\text{m}$  filter.



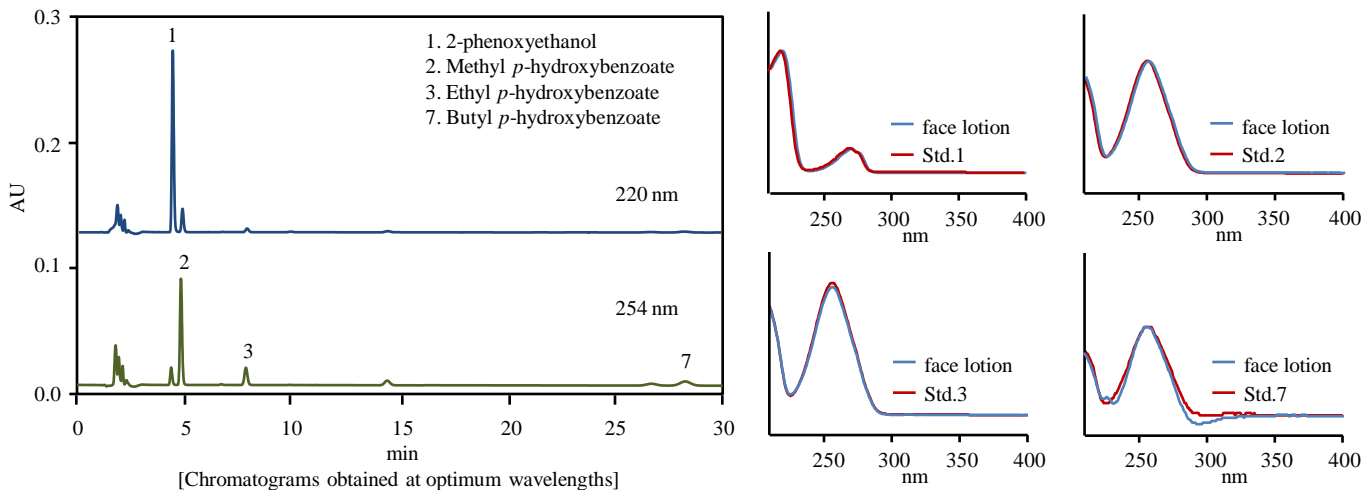
#### [Results]

In this sample, (1) 2-phenoxyethanol, (2) methyl *p*-hydroxybenzoate, (3) ethyl *p*-hydroxybenzoate, and (5) propyl *p*-hydroxybenzoate were detected. In addition, each peak matches well with a corresponding peak of the standard sample.

#### Commercial face lotion

[Pretreatment method of the samples]

0.1 g of sample was diluted to 10 mL with methanol and filtered with a 0.2  $\mu\text{m}$  filter.



#### [Results]

In this sample, (1) 2-phenoxyethanol, (2) methyl *p*-hydroxybenzoate, (3) ethyl *p*-hydroxybenzoate, and (7) butyl *p*-hydroxybenzoate were detected. In addition, each peak matches well with a corresponding peak of the standard sample.

Reference : Osaka Prefectural Institute of Public Health Report No. 47, 2009 (Japan)

System configuration : Primaide 1110 Pump, 1210 Auto Sampler, 1310 Column Oven, 1430 DAD

NOTE : These data are an example of measurement; the individual values cannot be guaranteed.

The system is for research use only, and is not intended for any animal or human therapeutic or diagnostic use.