

## High Speed Analysis of Melamine in Dairy Product

### Introduction

Melamine is a kind of organic nitrogen compounds which have triazine ring in the center of their structure. It is used as the material of melamine resin which has high thermal and water resistance and is used for mechanical strengthening. Recently, there was a case that melamine was used as an additive of diluted milk in order to pretend as the high protein content, and then milk product made from these milk have caused the health problem. In order to secure the safety of food, Food and Drug Administration (FDA) has been evaluating the risk of melamine and also assigned HPLC (UV detection method) as one of the analysis methods of melamine in food.

In this paper, the analysis results of melamine in milk product measured using PDA detector are reported.

**Keyword:** milk product, melamine, C8 column, 5  $\mu\text{m}$ , PDA detector

### Experimental

#### Equipment

Pump: PU-2089  
 Column oven: CO-2065  
 Autosampler: AS-2057  
 Detector: MD-2018

#### Conditions

Column: ZORBAX RX-C8 (4.6 mmID x 150 mmL, 5  $\mu\text{m}$ )  
 Eluent: 10mM Citric acid, 10mM Sodium-1-octanesulfonate in Water/Acetonitrile/Methanol (85/7.5/7.5)  
 Flow rate: 1.0 mL/min  
 Column temp.: 40°C  
 Wavelength: 200-400 nm  
 Injection volume: 10  $\mu\text{L}$   
 Standard sample: Melamine 10 mg/mL in Water

### Result

Fig. 1 shows the structure of melamine and Fig. 2, Chromatogram and contour plot of melamine standard sample.

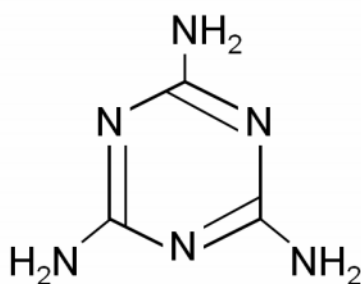


Fig. 1 Structure of melamine

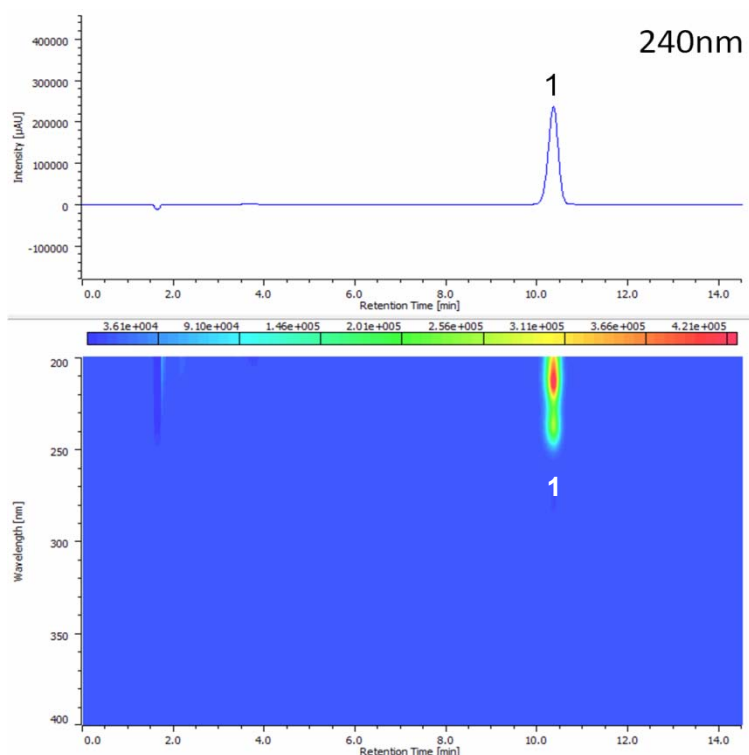
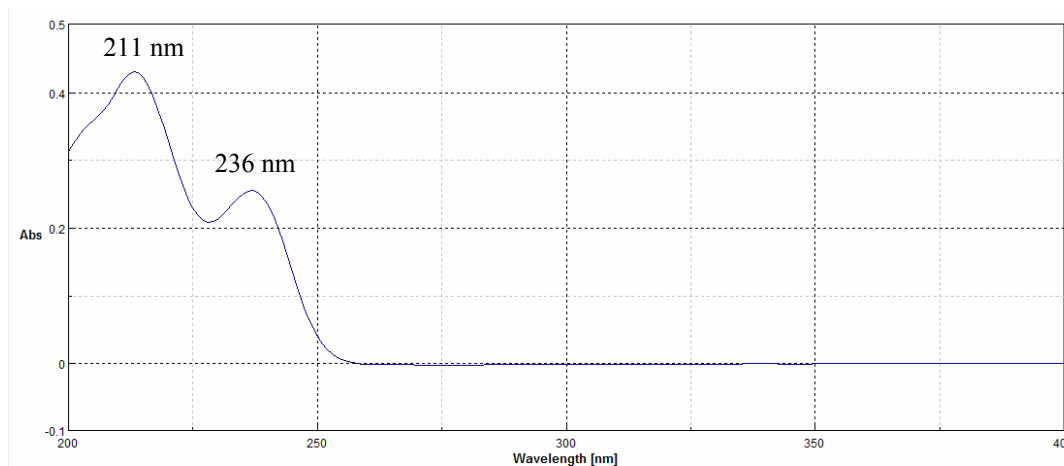


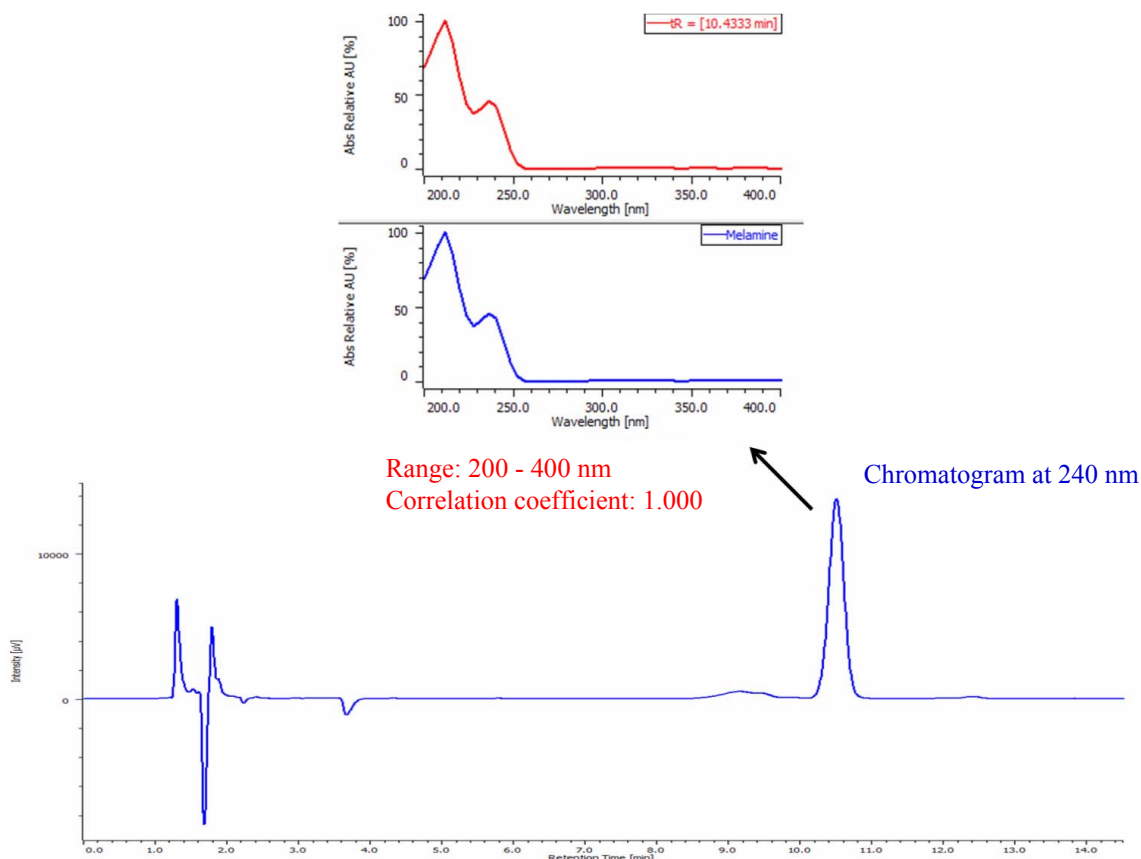
Fig. 2 Chromatogram of melamine  
 1. Melamine

Fig. 3 shows the on peak spectrum of melamine standard sample. The clear spectrum was obtained.



**Fig. 3** On peak spectrum of melamine standard sample

Fig. 4 shows the chromatogram and on peak spectrum of milk added with melamine. By registering spectrum of standard sample in Fig. 3, the correlation coefficient was calculated to be as good as 1.000.



**Fig. 4** Chromatogram of milk added with melamine

Sample preparation: 20  $\mu\text{L}$  of 100  $\mu\text{g/L}$  melamine solution was added to 180  $\mu\text{L}$  of milk, diluted by 1800  $\mu\text{L}$  of ultrapure water and added to 200  $\mu\text{L}$  of eluent. The solution was centrifugated at 5000 rpm in 10 min, and then the supernatant was filtrated using 0.45  $\mu\text{m}$  membrane filter.