



High Speed Analysis of Melamine in Dairy

Introduction

Melamine is an organic nitrogen compound which has a triazine ring in the center of its 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 to diluted milk to make-up for the lack protein content, however, this milk product caused health problems. The Food and Drug Administration (FDA) has been evaluating the risk of melamine and has assigned HPLC with UV detection as one of the analysis methods of melamine in food.

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



Keywords: milk product, vv, C8 column, 5 μ m, PDA detector, FDA

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 µm)
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 µL
Standard sample:	Melamine 10 mg/mL in Water

Results

Figure 1 shows the structure of melamine, while figure 2 shows the chromatogram and contour plot of melamine.

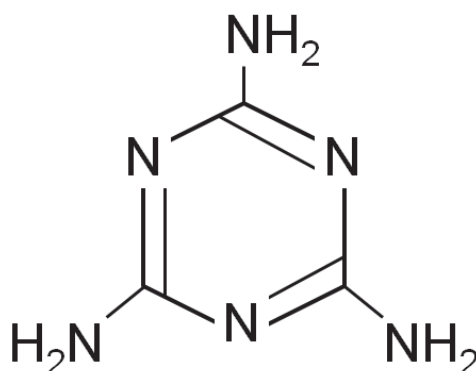


Figure 1 Structure of melamine

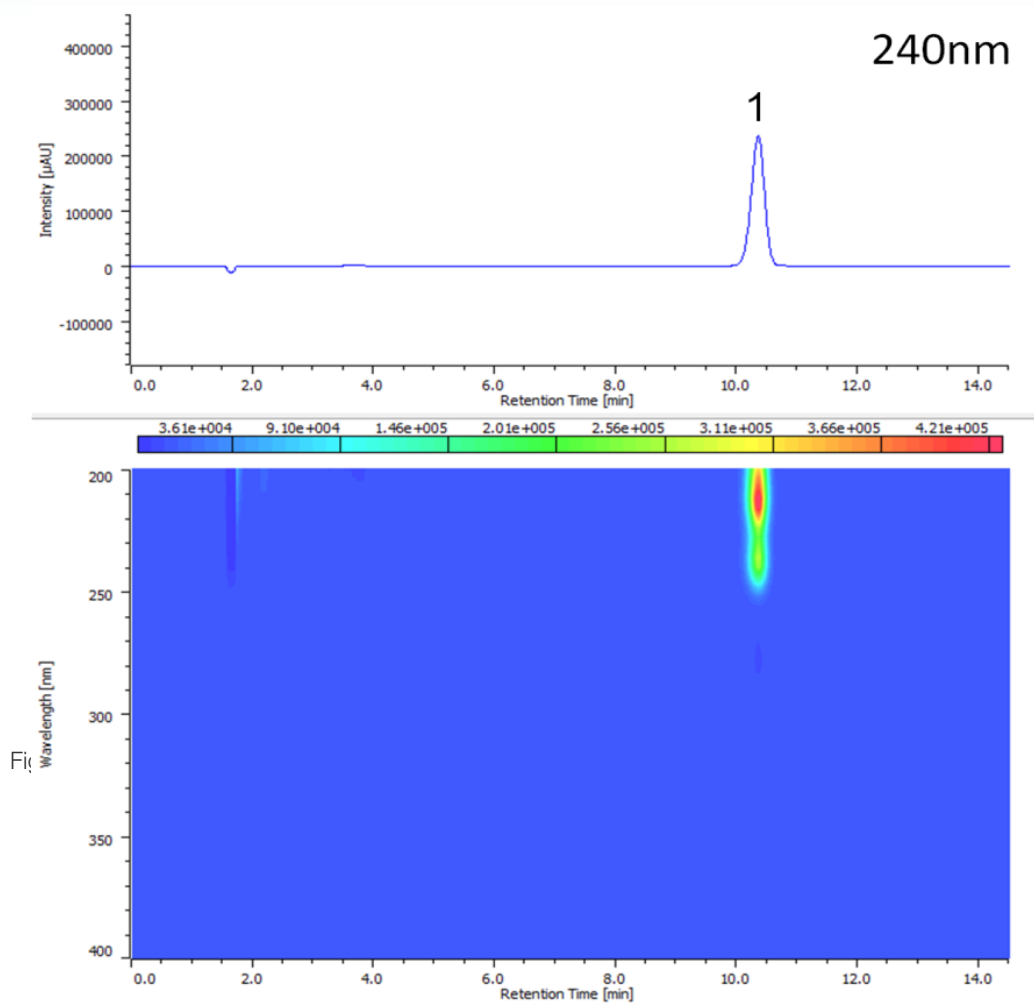


Figure 2. Spectrum of piperine sample

Figure 3 shows the on peak spectrum of the melamine standard sample.

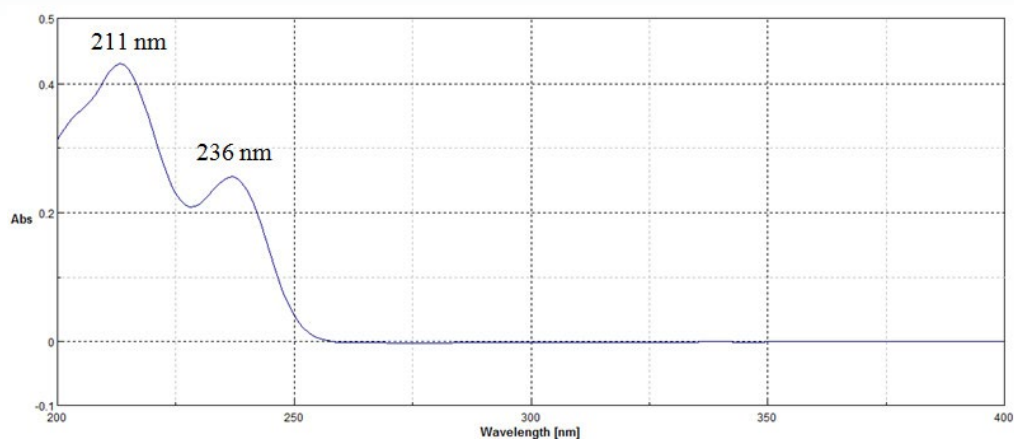


Figure 3 On peak spectrum of the melamine standard sample.

Figure 4 shows the chromatogram and on peak spectrum of milk spiked with melamine. By registering the spectrum of the standard sample in figure 3, the correlation coefficient was calculated to be 1.000.

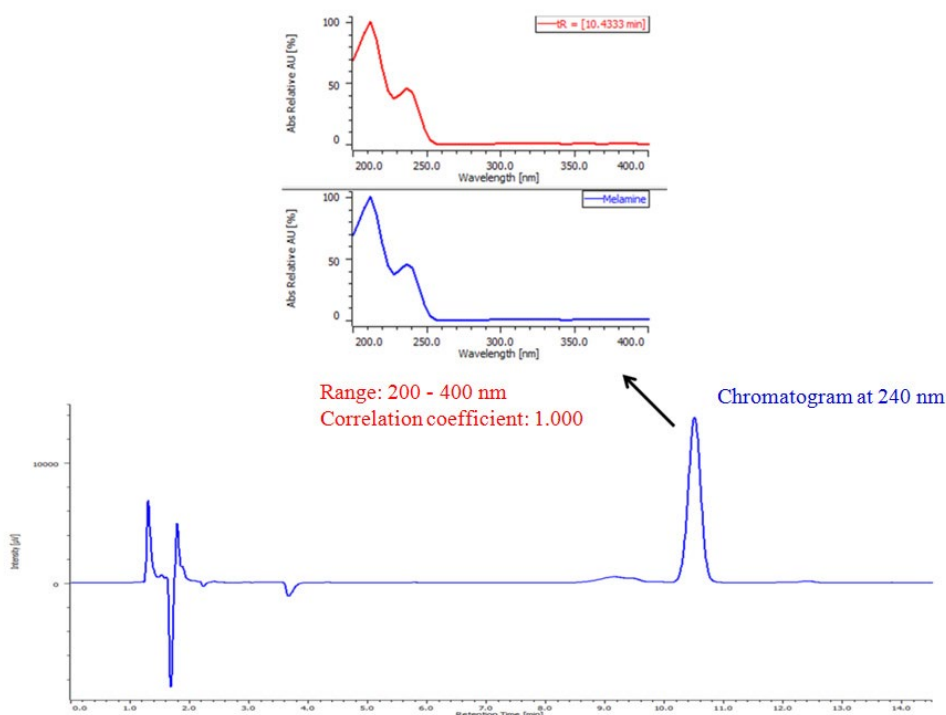


Figure 4 Chromatogram of milk spiked with melamine.

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