



Determination of artificial sweeteners using LC-MS/MS

Artificial sweeteners are used as substitutes for sugar in many food items, as they exceed the sweetening power of sugar without a physiological calorific value. The sweeteners acesulfame, saccharin and cyclamate are particularly common as they can also be used for cooking and are therefore useful for diabetic patients. In addition, these sweeteners

are widely used in tooth paste, as they do not cause caries. Artificial sweeteners are excreted by the body largely unchanged and are poorly broken down in sewage treatment plants, so that they can enter ground and surface water via polluted wastewater. Highly sensitive analytical methods are required to assess the degree of contamination.

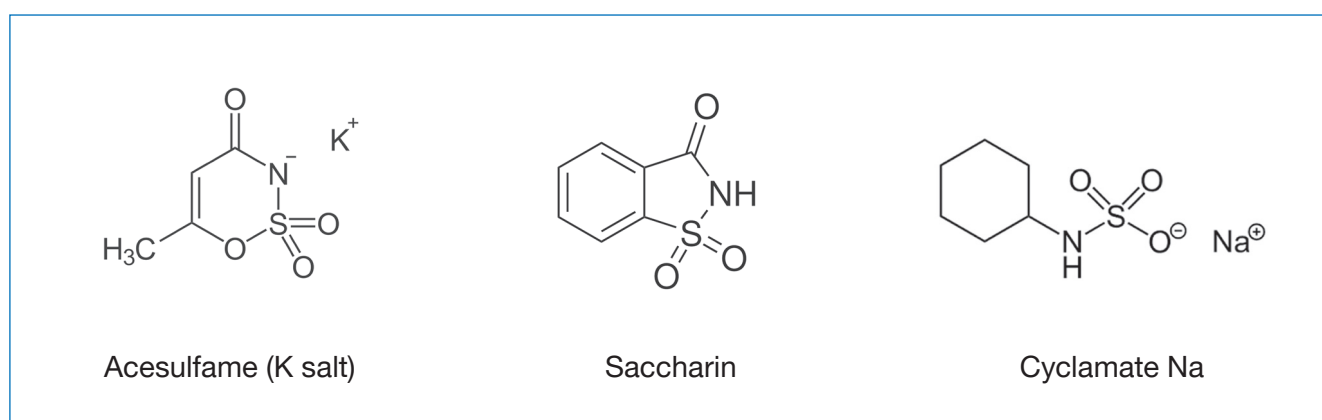
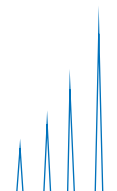


Figure 1: Structures of acesulfame, saccharin and cyclamate Na.

This application note demonstrates the analysis of acesulfame (K salt), saccharin and cyclamate Na in the low concentration of 0.1 µg/L using a YMC-Triart C18 UHPLC column and MS/MS detection. The analysis is performed in less than 10 min at 35 °C using water and methanol containing 10 mmol ammonium formate as eluents.

Table 1: chromatographic conditions

Column:	YMC-Triart C18 (1.9 µm, 12 nm) 100 x 3.0 mm ID
Part No.:	TA12SP9-1003PT
Eluent:	A) 10 mmol ammonium formate B) methanol containing 10 mmol ammonium formate
Gradient:	2–75%B (0–6 min), 75–2 %B (6–6.1 min), 2%B (6.1–12 min)
Flow rate:	0.3 mL/min
Temperature:	35 °C
Injection:	40 µL
Detection:	ESI negative, Applied Biosystems MDS Sciex API 4000
System:	Agilent 1100 HPLC system and CTC Analytics HTC-Pal Autosampler



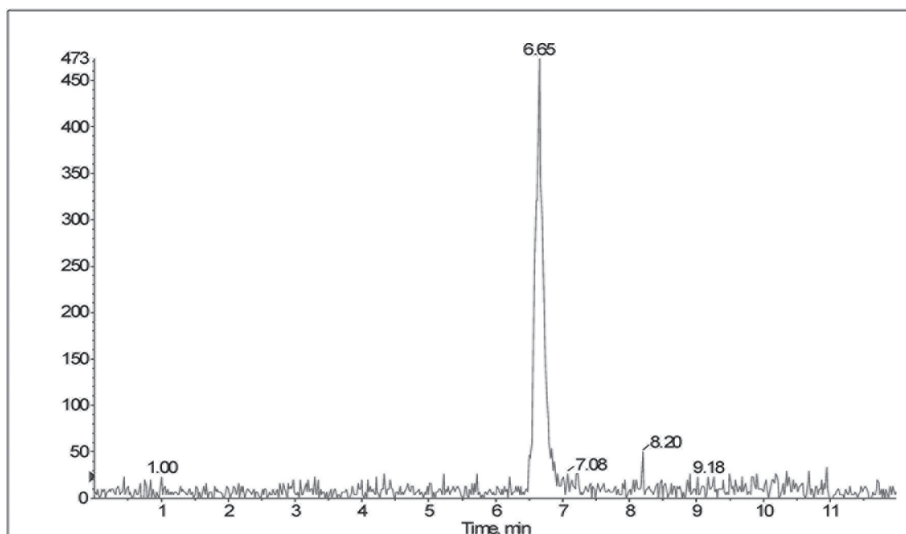


Figure 2: Extracted Ion Chromatogram (XIC) of Acesulfame K, 0.1 µg/L

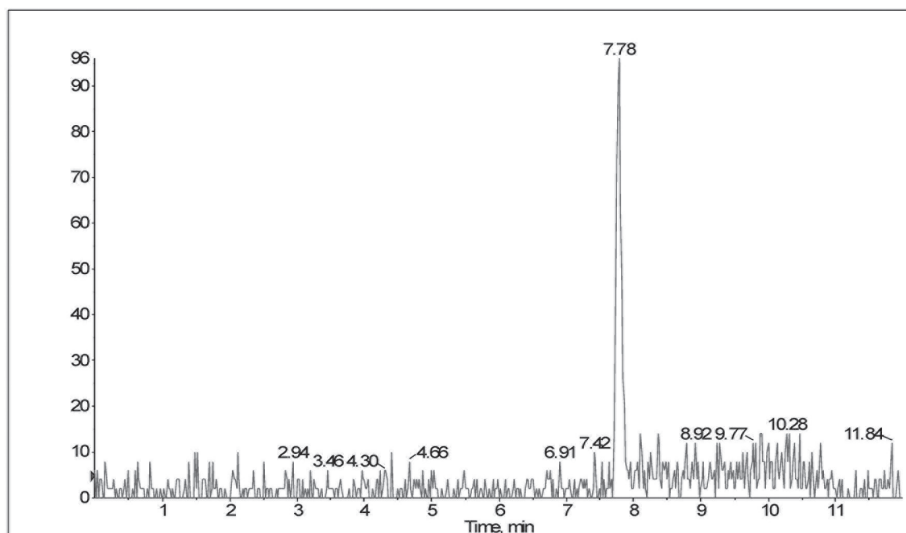


Figure 3: Extracted Ion Chromatogram (XIC) of Saccharin, 0.1 µg/L

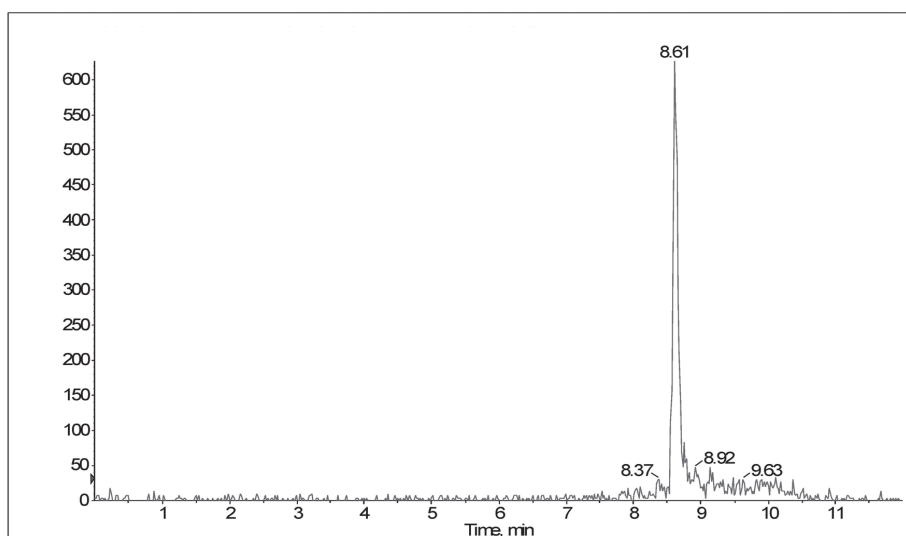


Figure 4: Extracted Ion Chromatogram (XIC) of Cyclamate Na, 0.1 µg/L

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