ST06 Simultaneous determination of four sweeteners in e-liquids by ultra performance liquid chromatography

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Contents

Background

- Some countries or regions restrict the use of some sweeteners in e-liquids.
- The combination and content of sweeteners affect the flavor of e-liquids.
- Monitoring the sweeteners in e-liquids can help improve product quality.
- It is necessary to establish a method for simultaneously determining multiple sweeteners.

Developed methods

Chromatographic Contition

- **Sample preparation**

Dissolved in 30% acetonitrile aqueous solution

- **Mobile phase**

- ✓ **Type**:

A: acetonitrile

B:20mmol/L ammonium acetate (Deionized water、0.1% formic acid、0.1% acetic acid)

- ✓ **pH of B** :4.5 (6.5 、5.5、3.5、2.5)

Developed methods

Chromatographic Contition

- **Coulomn:**

  Waters ACQUITY UPLC HSS T3 column (2.1 mm×100 mm,1.8 μm)

- **DAD:** 210nm

- **Gradient elution conditions:**

  0-4.5 min, 98% B; 4.5-9.5 min, 80% B; 9.5-13.4 min, 50% B; 13.4-13.5 min, 98% B;

  13.5-17 min, 98% B

- **Temperature：** 35℃

Developed methods

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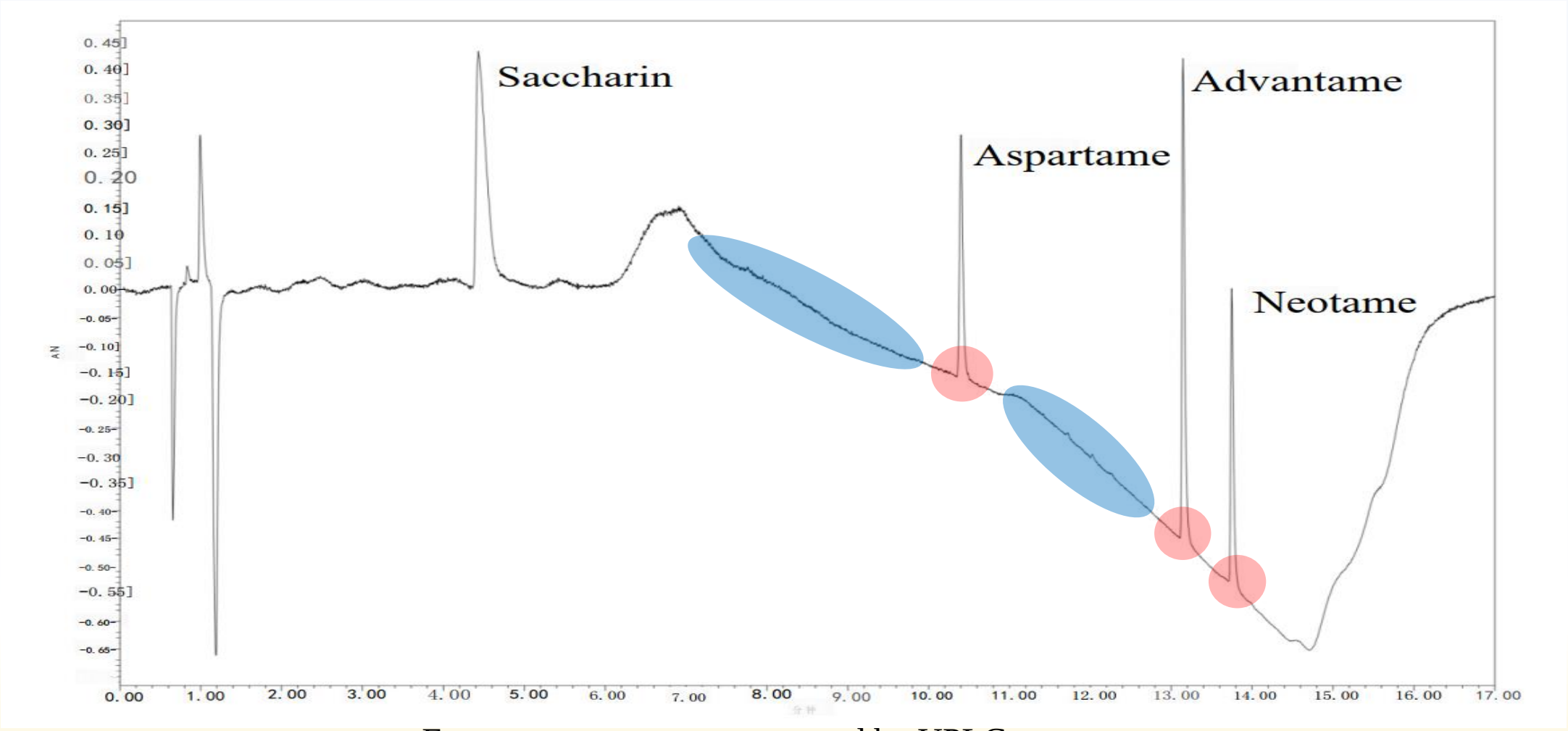
Chromatogram



Four sweeteners were separated by UPLC

Developed methods

Method validation

Sweeteners	Correlation coefficients（R^2)	Recoveries (%)	Detection limits	Quantiation limits
Saccharin	0.9994	101.1-108.1	63.8ppm	212.7ppm
Aspartame	0.9992	97.5-104.8	49.8ppm	165.9ppm
Advantame	0.9994	93.6-108.3	25.8ppm	85.9ppm
Neotame	0.9991	92.5-103.9	8.1ppm	26.8ppm

Samples analysis

Sweeteners	Fruit flavor							Mint flavor		Tobacco flavor
	1#	2#	3#	4#	5#	6#	7#	8#	9#	10#
Saccharin	0.01%	ND	ND	ND	0.03%	ND	ND	ND	ND	ND
Aspartame	ND	0.02%	ND	ND	ND	0.02%	ND	ND	ND	ND
Advantame	ND	ND	ND	0.01%	ND	ND	ND	ND	ND	ND
Neotame	0.13%	0.13%	0.24%	0.19%	0.22%	0.18%	0.24%	ND	0.37%	ND

ND: Not Detected

Conclusion

- Developed a simultaneous determination of four sweeteners in e-liquids.
- This method can identify whether e-liquids contain a potentially harmful sweetener like aspartame.
- To some extent, using this method to understand the composition of sweeteners in e-liquids is conducive to improve the flavor.

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Thanks

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