

Determination of honey adulteration with LC-IRMS

Honey is a high value commodity, whose quality is defined both by its botanical and geographical origin. This generates a strong consumer demand for certain, premium-priced products, which have become the target for adulterations. A useful tool to detect the addition of sugar to honey products is based on the well documented difference in $\delta^{13}\text{C}$ values between C3 (natural honey) and C4 (added sugar) plants. LC-IRMS has the unrivaled advantage of the simultaneous determination of $\delta^{13}\text{C}$ values from glucose, fructose, di-, tri- and oligo-saccharides, allowing the detection of more sophisticated honey adulteration with a simple user-friendly analytical system.

Unlike the existing LC-inlet solution via chemical oxidation, the iso CHROM LC cube works with high-temperature combustion. Thanks to the low-dispersion gas flow path, no significant peak tailing is observed that sacrifice chromatographic resolution.

	GLUCOSE	FRUCTOSE	DIFF	DISACCHARIDE	MAX _{DIFF}
ORIGIN / TYPE	$\delta^{13}\text{C}$ [‰]	$\delta^{13}\text{C}$ [‰]	$\Delta \delta^{13}\text{C}$	$\delta^{13}\text{C}$ [‰]	$\Delta \delta^{13}\text{C}$
Germany	-26.83 ± 0.04	-26.70 ± 0.02	0.13	-28.30 ± 0.02	1.60
Portugal	-27.24 ± 0.06	-28.16 ± 0.01	0.92	-27.12 ± 0.05	1.04
Thailand	-24.28 ± 0.05	-25.17 ± 0.13	0.89	-25.35 ± 0.07	1.07
Japan	-24.26 ± 0.07	-25.02 ± 0.01	0.78	-25.58 ± 0.12	1.33
the Netherlands	-25.93 ± 0.04	-26.69 ± 0.13	0.76	-26.63 ± 0.17	0.76
Adulterated honey #1	-22.99 ± 0.03	-24.67 ± 0.07	1.68	-24.30 ± 0.02	1.68
Adulterated honey #2	-22.68 ± 0.01	-23.56 ± 0.14	0.87	-17.24 ± 0.10	6.31

The LC-IRMS results using the iso CHROM LC cube LC-interface show outstanding precision combined with an unrivaled robustness. Thus, it is the perfect choice for routine, high-throughput, compound-specific LC-IRMS analysis of honey to detect sophisticated adulteration processes.

INSTRUMENT:

iso CHROM LC cube

DETAILS:

sample: honey



Elementar Analysensysteme GmbH
Elementar-Straße 1
63505 Langenselbold (Germany)
phone: +49 (0) 6184 9393-0
info@elementar.de | www.elementar.de

