

DATA BULLETIN

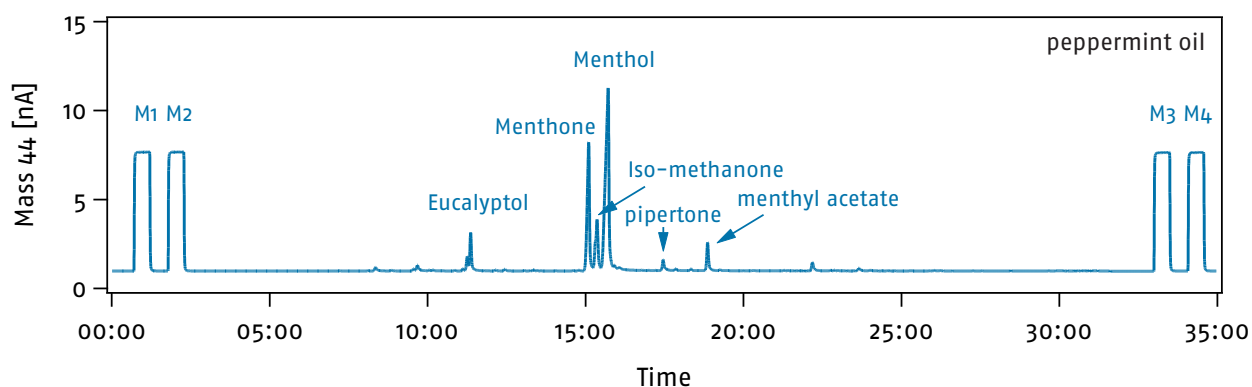
Compound specific $\delta^{13}\text{C}$ analyses in essential oils

Essential oils are concentrated mixtures of volatile organic compounds. These oils are highly prized for their aromas and health and well-being properties. Guaranteeing that these oils originate from genuine natural sources and are pure is important for consumer confidence and stable isotope analysis of these oils helps validate their quality. This data bulletin demonstrates carbon-13 isotope analysis by Aromavision of three common oils: peppermint, lavender and orange oil.

OVERVIEW

Stable isotope ratio analysis is a powerful tool that can distinguish chemically identical substances made by different processes such as natural or synthetic synthesis.

PEPPERMINT OIL	$\delta^{13}\text{C}_{\text{VPDB}}$ (‰)	SD (‰)
Eucalyptol	-31.71	0.20
D-Limonene	-30.07	0.16
Menthone	-30.25	0.14
Isomethanone	-28.71	0.14
Menthol	-29.31	0.06
Pipertone	-35.78	0.29
methyl acetate	-34.50	0.31



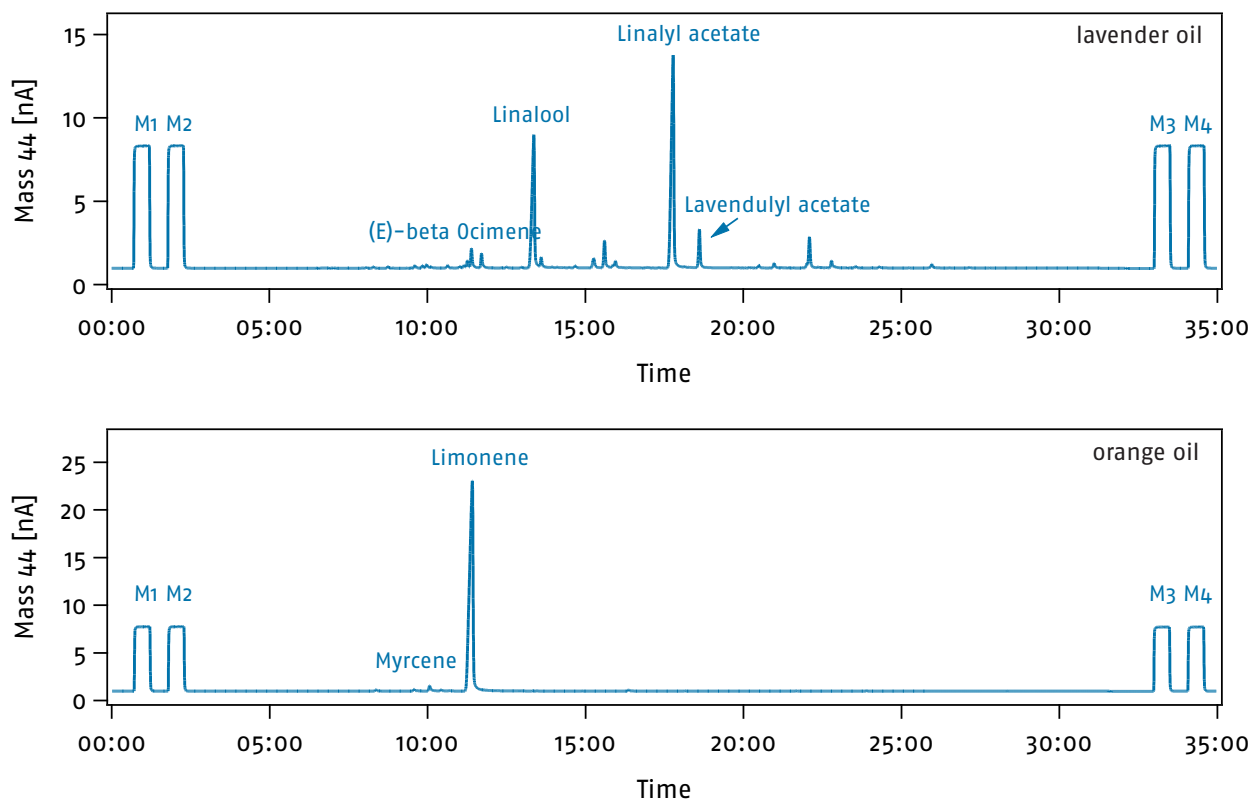


Figure 1: Chromatograms of peppermint oil, lavender oil and orange oil. The signal of mass 44 is shown, and the main compounds are marked. M1-4 are injections with pure CO₂ gas used for monitoring the instruments performance.

LAVENDER OIL	$\delta^{13}C_{VPDB}$ (‰)	SD (‰)
(E)-beta-Ocimene	-27.45	0.09
gamma-3-Carene	-29.89	0.47
Linalool	-29.32	0.06
Borneol	-32.34	0.47
Terpinen-4-ol	-31.32	0.13
Linalyl acetate	-27.34	0.05
Lavandulyl acetate	-30.99	0.09
(E)-Caryophyllene	-31.19	0.26

ORANGE OIL	$\delta^{13}C_{VPDB}$ (‰)	SD (‰)
Myrcene	-35.18	0.23
Limonene	-28.74	0.04

Conclusion

Carbon isotope analysis of essential oils via compound specific GC-IRMS is a relatively simple analysis yielding excellent performance. The large dynamic range in abundance of constituent compounds is handled with ease by Aromavision with robust analysis over all sample concentrations.

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