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Letter to the editor

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Dear Sir

Addendum to values of relative retention against solute boiling point (on) a liquid crystal stationary phase [1].

The above data has been re-evaluated using the CURVE program for the Hewlett–Packard 85B computer. Linear expressions were published in 1996 [1] for the MPMS liquid crystal phase in a 25 m capillary (Alltech) using five low-polarity solutes found in volatile oils, considering their boiling points (°C, 760 mm) against their relative retentions (*n*-tetradecane=1.00). These indicated a slight difference between the response of the melted, mesomeric phase at 160°C and the unmelted phase at 130°C. The expressions have been redetermined using data for ten solutes with good correlation – all seven of low-polarity plus the acyclic monoterpenoids citronellal, citronellol and linalol. They are now very similar [Table 1, expressions (1) and (2)] indicating the MPMS phase responds no differently to these solutes either above or below its melting point.

Other types of solutes cannot be added to these expressions, such as monocyclic or bicyclic oxygen-containing monoterpenoids.

Finally, re-examining all the data, ten polar solutes of diverse chemical types can be selected to give expressions with good correlation at both temperatures which are also virtually the same [see (4) and (3), Table 1]. These solutes are acyclics citral and linalol; monocyclics carvone, menthone and 4-terpineol; bicyclics camphor and thujone; and ten-carbon aromatic substances cuminal, estragole and safrole.

The constants in the expressions describing the ten polar solutes are much higher than those for the other substances, and reflect the behaviour of truly polar solutes on MPMS. Expressions (3) and (1) are descriptors of the expected behaviour of MPMS with polar and low-polarity solutes, respectively. However, aromatics anethole and thymol are retained more than expected from (3), but geraniol less so. There is little evidence of change in retention behaviour by this liquid crystal phase above or below its melting point. This explains the previously observed phenomenon of a datum point obtained at one temperature fitting an expression determined from the other temperature. Thus the expected solute selectivity of a mesomeric phase is not apparent by this assessment. However, MPMS may function as a liquid crystal below its melting point, possibly forming a transient eutectic with passing solute

Table 1
Linear expressions (and their correlation coefficients) to forecast relative retention (*n*-tetradecane=1.00) from *t* solute boiling point (°C, 760 mm) for selected solute groups on MPMS phase at two temperatures

Solute group	160°C	(*r*)	130°C	(*r*)
7 diverse low-polar+3 acyclics[a]	(1)=0.01199*t*−1.74	(0.992)	(2)=0.01179*t*−1.81	(0.995)
10 diverse polar	(3)=0.05987*t*−11.22	(0.983)	(4)=0.05950*t*−11.32	(0.990)

[a] Monoterpenoids.

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bands [1], to enable it to behave very similarly at both temperatures.

Yours faithfully

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References

[1] T.J. Betts, J. Chromatogr. A, 743 (1996) 341.