

Improving the Selectivity of Analysis Using Highly Polar Phases

INTRODUCTION

- The analysis of volatile mixtures using gas chromatography is demanding and the use of complimentary phases can offer benefits to complete separation. Highly polar phases are noteworthy as their retention mechanism is orthogonal to other phases and so can yield quite different separations.
- We describe here the use of a carborane phase (HT8), a non-polar phase (BPX5) and a highly polar phase (BPX90) for some common analyses that often suffer from coelution problems.
- Phase chemistry is an important consideration in selecting a GC column for both single and two-dimensional applications.

RESULTS

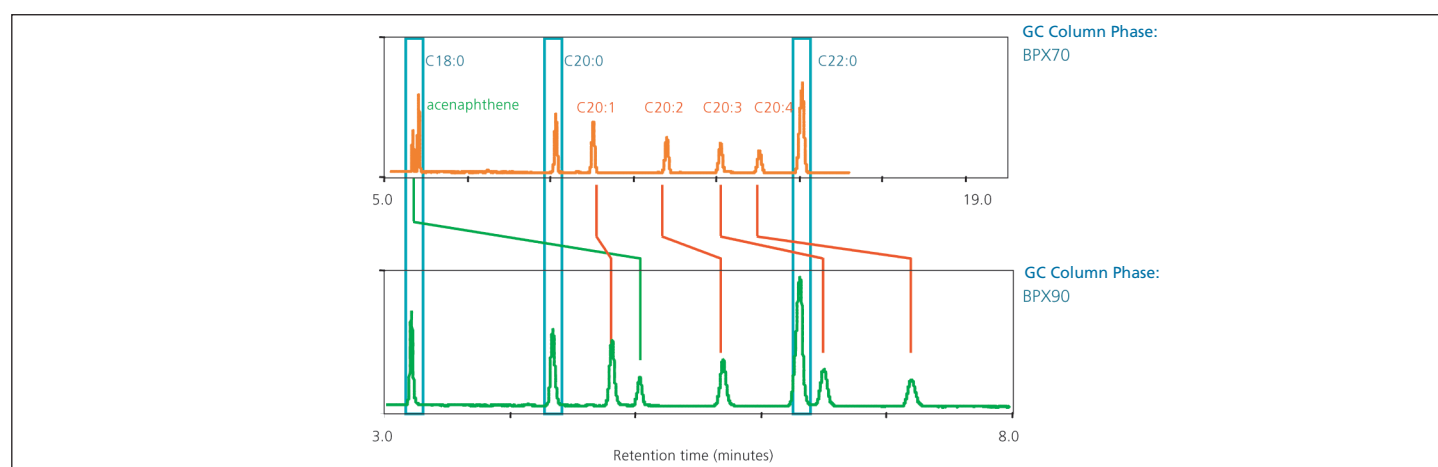


Figure 1. Analysis of polyunsaturated FAME on BPX70 and BPX90.

- BPX90 offers greater separation of polyunsaturated fatty acid methyl esters including the resolution of complex mixtures of FAME positional isomers and the separation of cis and trans isomers.
- The very polar phase enables faster elution of high molecular weight FAMEs without loss of resolution.

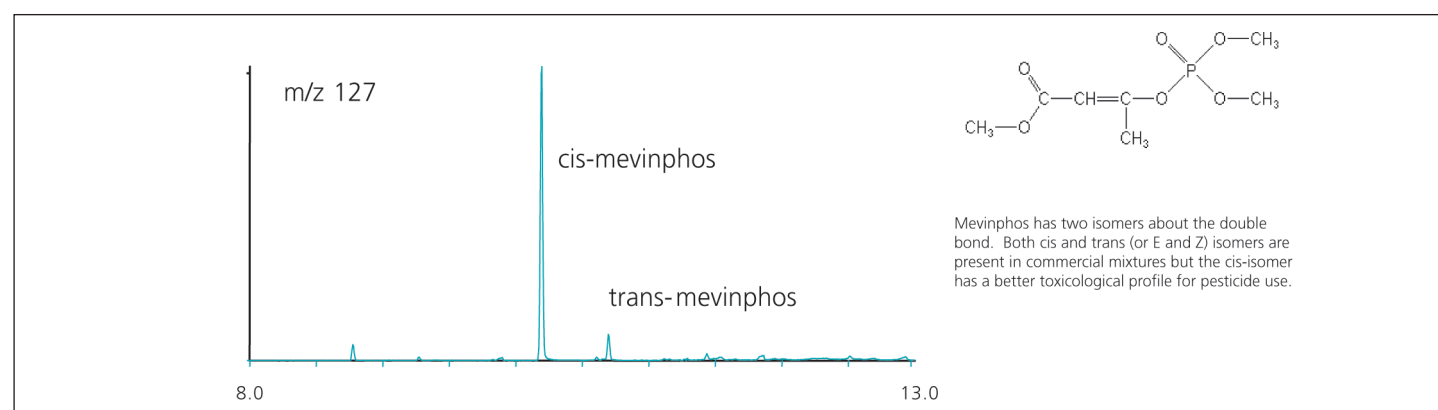


Figure 2. Separation of cis and trans isomers on BPX90.

- Mevinphos has an extended π -electron system that allows for highly selective interaction with BPX90.
- The phase is also useful for separation of other conjugated isomer pairs using a mechanism other than boiling point.

APPLICATION NOTE

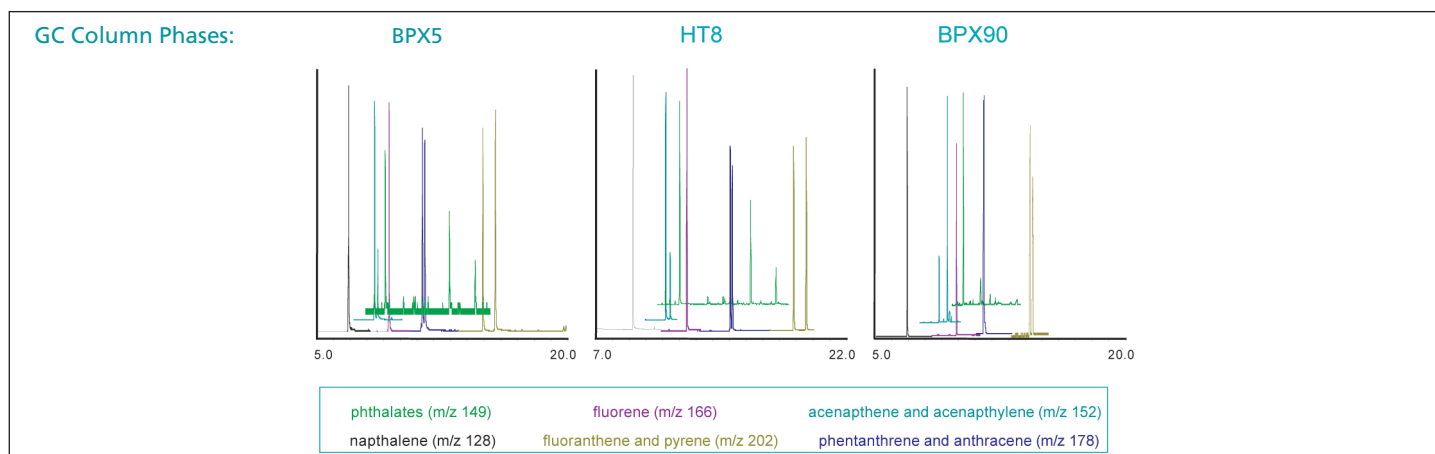


Figure 3. Analysis of aromatic compounds on BPX5, HT8 and BPX90.

- BPX90 offers an alternative to HT8 and BPX5 phases for the speciation of complex aromatic mixtures.
- The reversal of elution order for acenaphthene and acenaphthylene when using BPX90 is typical of the phase's high selectivity for conjugated aromatics.

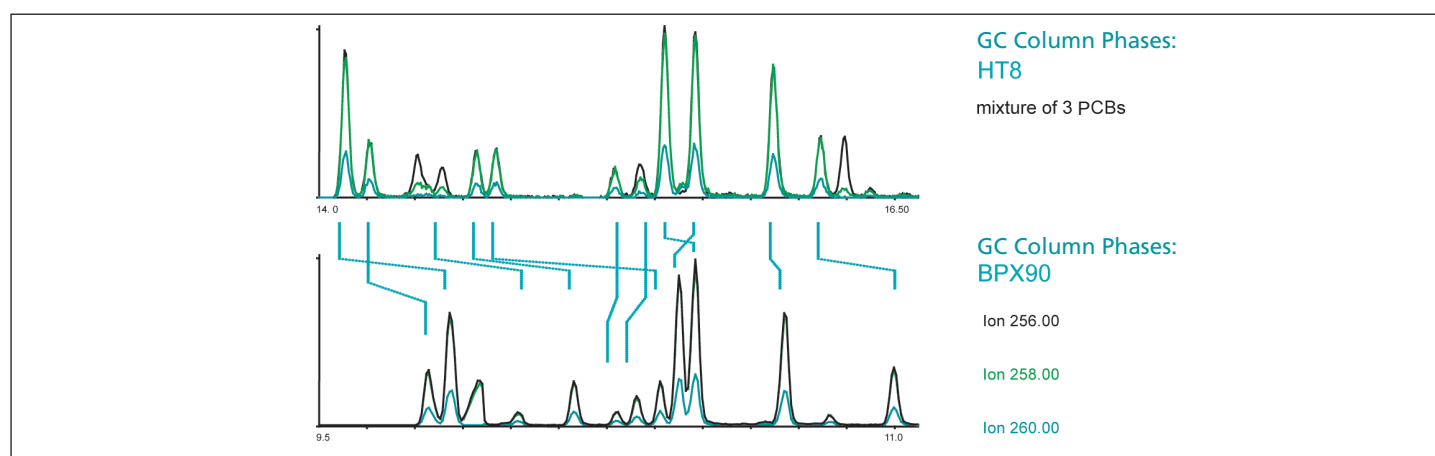


Figure 3. Selectivity for PCB's on HT8 and BPX90.

- Complete analysis of polyhalogenated aromatic compounds such as PCBs, PBDEs, PCDFs and dioxins requires a high degree of resolution for congener mixes.
- HT8 is the column of choice in many applications for its unique selectivity. BPX90 is a thermal stable phase that offers complimentary separation based on π - π interactions.

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