

Application Note No. 065

# The Analysis of Pyrethroids using the AT-Column Concentrating Technique

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- Copes well with the difficult mixture of labile and sticky compounds
- No or very little optimisation is required

# Instrumentation

- ATAS Optic 2-200 programmable injector
- ATAS AT-Column kit
- HP5890 with HP5971

# Sample analysed

Cyfluthrin,  $\alpha$ -Cypermethrin and Flumethrin in dichloromethane

# **Principles**

- Sample is injected under AT-Column conditions
- An equilibrium is formed between the solvent vapour pressure and carrier gas pressure keeping the solvent in the liner
- · Solvent is vented, analytes are concentrated and transferred onto the head of the capillary column
- GC oven temperature program starts

#### Chromatogram Abundance



Time-->

Figure: Upper trace: first injection of 100 µL of 200 µg/L pyrethroids in DCM; lower trace: second injection of 100 µL DCM to check for carryover

#### Results

- RSDs: α-Cypermethrin 2.95%; Flumethrin 5.35% (standardised to Cyfluthrin)
- Carryover: None detected for any compound (see Figure)
- LOD: The required detection limit of 4 µg/L was easily reached for all compounds

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# Appendix

# **Optic Conditions:**



- Liner: AT-Column Mode: Large Volume Injection volume: 100-130 µL Gas Flows: Split: 50 ml/min • Vent: 120 ml/min 43 °C Initial temperature: • Vent time: Auto ٠ Ramp rate: 1 °C/s ٠ Final temperature: 300 °C • 0:00 m:s •
- Splitopen time:
- Purge pressure: 3.63 psi
- Transfer pressure: 8.00 psi
- ٠ Transfer time: 1:30 m:s
- ٠ Initial pressure: 8.00 psi 22 psi
- Final pressure:
- Solvent threshold: 15 •

# **GC-MS conditions:**

- Column: HP5-MS 30m x 0.25mm i.d. x 0.25 µm film •
- Initial Temperature: 56 °C hold 1 min ٠
- 25 °C/min to 195 °C hold 0 mins • Ramp 1:
- 7 °C/min to 280 °C hold 0 mins Ramp 2: •
- Ramp 3: 25 °C/min to 300 °C hold 10 mins ٠
- MSD transfer line: 280 °C •
- MSD SIM mode •

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