Application Note No. 080

Analysing Quaternary Ammonium Salts (QAS) in Seawater by Difficult Matrix Introduction (DMI)

Diane Nicholas

- ***No sample preparation necessary***
- ***Removes water under controlled conditions prior to analysis***
- ***Retains the salt and involatiles within the microvial***

Instrumentation

- ATAS Optic 2-200 programmable injector
- Agilent 5890 GC with 5971 MSD

Principles

- Inject 2-3 uL of seawater into a microvial and place in fritted liner in Optic injector
- Vent the water, heating the injector and column oven to 100 °C
- Thermally desorb the sample at high temperature to degrade the QAS, under static flow conditions
- Transfer the analytes directly onto the GC column and analyse by GC-MS

Chromatogram

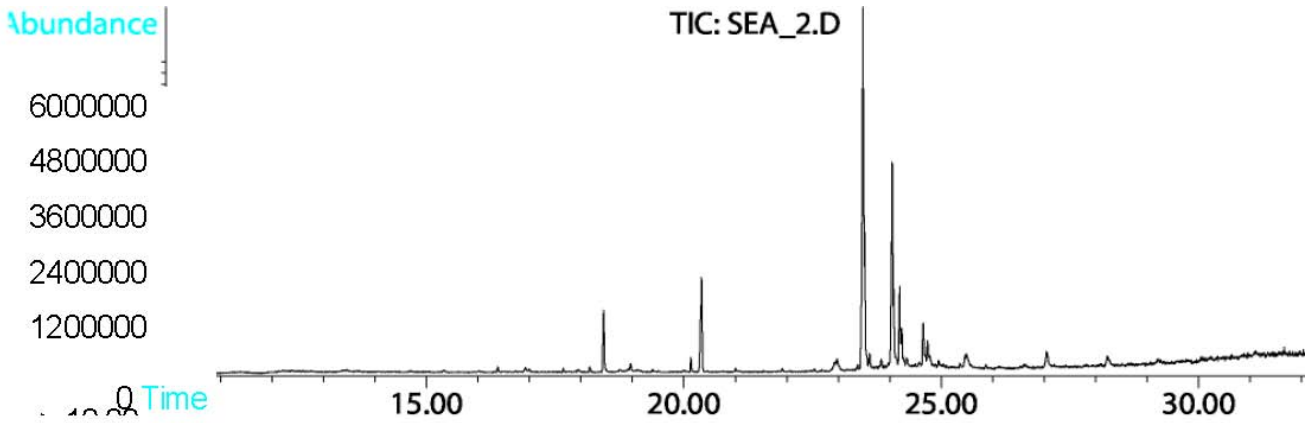
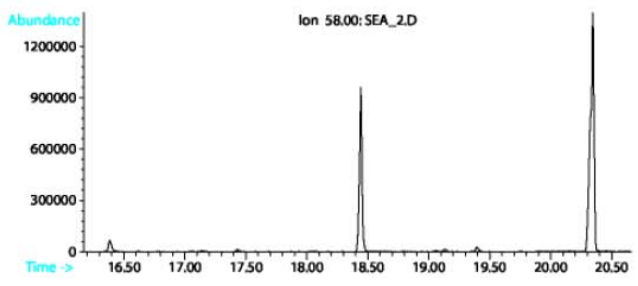


Figure 1: *TIC of analysis of seawater by DMI*



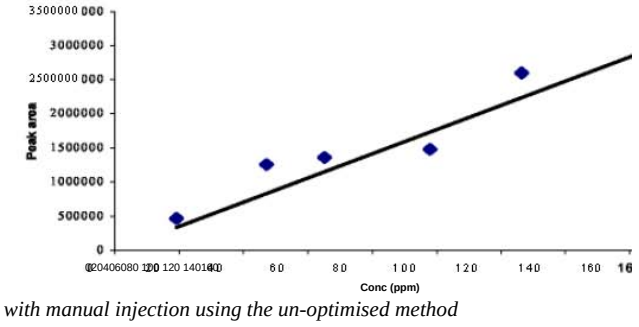


Figure 2: *Selected ion for the quaternary ammonium salt* ***Figure 3:*** *Calibration with manual injection using the un-optimised method*

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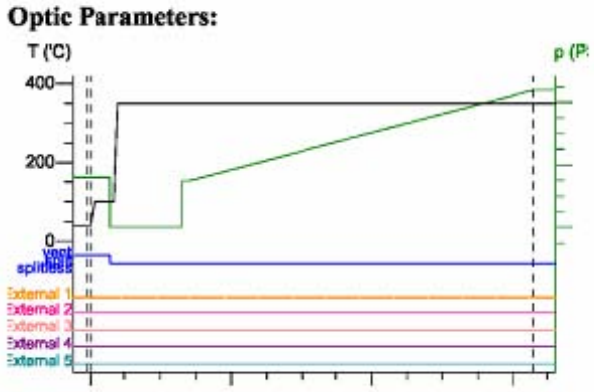
Liner: ATAS Fritted
Microvial: 6 mm
Mode: Expert
Gas Flows: Vent: 370 ml/min
Split: 50 ml/min
Initial temperature: 40 °C
Ramp rate 1: 4 °C/s
Final temperature 1: 100 °C
Hold time 1: 1.5 mins
Ramp rate: 16 °C/s
Final temperature: 350 °C
End time: 37.5 mins
Vent pressure: 8 psi
Vent time: 1.5 mins
Split open time: 1.5 mins
Desorption pressure: 0 psi
Desorption time: 5 mins
Transfer pressure: 7.4 psi
Transfer time: 0.5 mins
Initial pressure: 7.4 psi
Final pressure: 22 psi

GC Parameters:
Column: DB5-MS 30m x 0.25mm i.d. x 0.25um film
Initial temperature: 45 °C
Ramp rate 1:
Final temperature 1: 20 °C/min
Hold time 1: 100 °C 4.5
Ramp rate 2: mins 10
Final temperature 2: °C/min 350
°C

MS Parameters:
Acquisition mode: Scan
Low mass: High 50 m/z
mass: Sampling 400 m/z 2
number: Threshold: 500
Transfer line: 280 °C
Solvent delay: 10 mins

Appendix

Optic Parameters:



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