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METHOD STATEMENT BTEX / VOC TARGETS ON TENAX GC / MS

INTRODUCTION

The performance of this method is validated in accordance with internationally recognised procedures.

This procedure describes the determination of volatile organic compounds (VOC) on tenax tubes by thermal desorption - gas chromatography mass spectrometry (TD - GC / MS).

PRINCIPLE

A series of calibration standards are analysed by this method and the data are used for reference and calibration.

Deuterated internal standards are added to all samples, spikes and blanks prior to analysis. In instances where a compound is not present in the calibration material, a tentative identification and result is produced based upon a comparison of the mass spectra obtained with those found in the NIST mass spectral databases. Such tentative results are subject to confirmation by the analyst.

PERFORMANCE CHARACTERISTICS

SUBSTANCES DETERMINED

A range of volatile hydrophobic organic compounds, ranging in boiling points from circa -10 °C to 200 °C. Standard target suites include chlorinated solvents, 'BTEX' and other priority pollutants.

RANGE OF APPLICATION

- 200 - 800 ng (compound dependent)

LIMIT OF DETECTION

- 20 ng / sample

VALIDATION

Initial method validation was conducted via the analysis of 6 x 2 replicate spike samples prepared and analysed independently, along with a three point calibration, method blanks and independent QC samples. The precision, bias and uncertainty for each analyte was determined from the data acquired and found to be as follows for all analytes:

- Precision: < 5 %
- Bias: < 10 %
- Uncertainty: < +/- 10 %

Ongoing method performance is monitored via analytical quality control charts.



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ANALYTICAL QUALITY CONTROL

Analytical quality control is maintained by a number of measures:

- Multi-point calibration with authentic standards (with defined minimum performance characteristics).
- Analysis of control samples within each analytical batch, such as independent standards, matrix spikes or reference materials.
- Analysis of reagent / method blanks within each analytical batch.
- Ongoing quality assured by the use of control charts in conjunction with warning and action limits for the QC sample data.
- Participation in external proficiency testing and inter laboratory schemes such as HSE WASP.

REFERENCES

- US EPA Method 8260, Revision B, Volatile Organic Compounds by Gas Chromatography-Mass Spectrometry (GC/MS).