Method Summary

Determination of Whole Oil by Gas Chromatography (GC-FID)

Scope and Range

This method describes a procedure to determine the bulk characteristics and distillation range of hydrocarbon fuels from C5 to C40 by Gas Chromatography (GC) with flame ionisation detection (FID).
This method is applicable to the analysis of products and oil residues on soils and waters.
The age profile can be calculated on gasoline and diesel range material containing BTEX or pristane and phytane.
The extracts are speciated into the aliphatic and aromatic fractions and banded in the ranges >C6-C8, >C8-10, >C10-C12, >C12-C16, >C16-C21, >C21-C35 and >C35-C40 for the criteria working group (CWG).
This method is not accredited.

References

ASTM Manual on hydrocarbon analysis 3rd Edition.

Christensen and Larsen, Method for determining the age of diesel oil spills in the soil, 1993.

Kaplan, I.R., Y. Galperin, S. Lu, and R. Lee, Forensic environmental geochemistry: differentiation of fuel-types, their sources and release time, 1997.

Principle

A product or solvent extract is injected onto a gas chromatograph and is analysed by temperature programmed capillary chromatography and flame ionisation detection (FID). The chromatogram obtained serves as a "fingerprint" of the sample components and allows the determination of the bulk characteristic/possible distillation range of the sample. The distillation/boiling range are obtained by comparison to standards ran with every sequence, which can then be used to determine the carbon number range.
The percentage bands for the aliphatic and aromatic character can be calculated after a sample has been speciated for the CWG results.

Interferences

Solvents, reagent glassware and other sample processing hardware may yield artefacts and/or interferences to sample analysis. All these materials must be demonstrated to be free from interferences under the conditions of the analysis. This is undertaken by analysis of method blanks.