

Petroleum Forensic Information

ANALYSIS	MATRIX	METHOD	TARGET COMPOUNDS	PURPOSE	LIMITS
C3-C44 Whole Oil	Product	ASTM D3328 (GC/FID)	Gasoline PIANO, alkanes, isoalkanes	Provides a hydrocarbon fingerprint to identify and characterize petroleum products. Used as a screening analysis for unknown products. May compare gasoline, un-degraded diesel, jet fuel, kerosene, etc. from different locations. More detailed comparisons of degraded products are provided by GC/MS Full Scan.	Qualitative analysis only
Fuel Oxygenates	Product	EPA 1624 Mod.	MTBE, EtOH, DIPE, TAME, ETBE, TBA	Used to identify and characterize unleaded gasoline. May help in dating a range of release of gasoline.	100mg/Kg – TAME, DIPE 10mg/Kg – TBA, ethanol 5.0mg/Kg – ETBE, MTBE
Alkyl Leads, EDB, MMT	Product	EPA 8080 Mod. (GC/ECD)	5 alkyl lead compounds, EDB, and MMT	Used to identify and characterize leaded gasoline. May help in dating a range of release of gasoline.	0.5mg/L – EDB 5.0mg/L – TML, TMEL, DMDEL, MTEL, TEL, MMT
Simulated Distillation	Product	ASTM 2887	Petroleum products in a mixture	Provides an estimate proportion of each petroleum product in a mixed sample. May be useful in allocation of responsibility	Graph analysis
C8-C40 Full Scan	Product, Water, Soil	ASTM 5739 (GC/MS)	Alkanes, isoalkanes, cycloalkanes, aromatics, bicycane, sterane, terpane biomarkers	Provides fuel type characterization of crude oil and petroleum products heavier than gasoline by looking at the distribution of specific biomarkers. Used to compare degraded jet fuel, diesel, fuel oils, lube oil, crude oil, etc. from different locations.	100mg/Kg – TAME, DIPE 10mg/Kg – TBA, ethanol 5.0mg/Kg – ETBE, MTBE
Parent and Alkylated PAH Composition	Product, Water, Soil	EPA 8270 SIM Mod.	53 parent and alkylated 2-5 ring PAHs	Provides PAH concentrations to identify creosote, MGP residues, urban runoff, and other pyrogenic products to distinguish them from petroleum products. Useful for risk assessment.	PQL – 0.005ug/L, 5mg/kg
C3-C10 PIANO	Water, Soil	EPA 8260 Mod. GC/MS	Gasoline PIANO	Provides concentrations of gasoline range compounds. It will help determine if different samples contain the same or different gasolines	PQL – 5mg/L, 5mg/kg
C10+ Alkane Fingerprint	Water, Soil	ASTM 3328Mod	N-alkanes and isoalkanes	Provides an alkane fingerprint of middle distillates such as jet fuel, diesel, home heating oil etc. Screening information and useful for mildly to moderately degraded fuels.	Qualitative analysis only

Analytical data interpretation and interpretive reports may also be provided at an additional cost by a technical expert. This may help identify the petroleum products in samples, determine whether the samples and products are related, and may be able to provide an estimated time of release or age of the product. These results may be correlated with other site characteristics to provide a more thorough understanding of the nature and origin at a site. Providing as much background information about a site will allow for the most complete data interpretation.