

Going Organic

The "Hows" and "Whys" of Sampling for
Organic Compound Analysis

OR

What You Need to Do in the Field to
Ensure Defensible Analytical Data

Going Organic

- Some necessary definitions
- Sampling protocol
- Brief overview of analysis

What Exactly is an Organic Compound?

- Carbon
- Hydrogen, Nitrogen, Oxygen, Sulfur & Phosphorous
- Halogens

What Exactly is an Organic Compound?

NOT

- Carbonates
- Carbides
- Cyanides

What Makes Organic Sampling So Special?

- Structure and composition changes
- Trace level analysis...ppb - ppt

Analytes of Interest

- Volatile Organic Compounds
- Semi-Volatile Organic Compounds

List of Volatile Organic Compounds (VOC)

Contamination	Name	CAS	Molecular Weight
PROPANE	PROPANE	74-98-6	44.1
N-BUTANE	N-C4	106-97-8	58.12
N-PENTANE	N-C5	109-66-0	72.15
N-HEXANE	N-C6	110-54-3	86.18
N-HEPTANE	N-C7	142-82-5	100.21
N-OCTANE	N-C8	111-65-9	114.23
N-NONANE	N-C9	111-84-2	128.26
N-DECANE	N-C10	124-18-5	142.29
N-UNDECANE	N-C11	1120-21-4	156.31
N-DODECANE	N-C12	112-40-3	170.34
N-TRIDECANE	N-C13	629-50-5	184.37
N-TETRADECANE	N-C14	629-59-4	198.4
N-PENTADECANE	N-C15	629-62-9	212.42
N-C16	N-C16	544-76-3	226.45
N-C17	N-C17	629-78-7	240.46
N-C18	N-C18	593-45-3	254.49
N-C19	N-C19	629-92-5	268.51
N-C20	N-C20	112-95-8	282.54
N-C21	N-C21	629-94-7	296.57
N-C22	N-C22	629-97-0	310.59
ISOBUTANE	2-ME-C3	75-28-5	58.12
NEOPENTANE	22-DM-C3	463-82-1	72.15
ISOPENTANE	2-ME-C4	78-78-4	72.15
BRANCHED C5 ALKANES	BR-C5		72.15
2,2-DIMETHYL BUTANE	22-DM-C4	75-83-2	86.18
2,3-DIMETHYL BUTANE	23-DM-C4	79-29-8	86.18
2-METHYL PENTANE	2-ME-C5	107-83-5	86.18
3-METHYLPENTANE	3-ME-C5	96-14-0	86.18
BRANCHED C6 ALKANES	BR-C6		86.18
2,2,3-TRIMETHYL BUTANE	223TM-C4	464-06-2	100.21
2,2-DIMETHYL PENTANE	22-DM-C5	590-35-2	100.21
2,3-DIMETHYL PENTANE	23-DM-C5	565-59-3	100.21
2,4-DIMETHYL PENTANE	24-DM-C5	108-08-7	100.21
2-METHYL HEXANE	2-ME-C6	591-76-4	100.21
3,3-DIMETHYL PENTANE	33-DM-C5	562-49-2	100.21
3-METHYL HEXANE	3-ME-C6	589-34-4	100.21
BRANCHED C7 ALKANES	BR-C7		100.21
2,2,3,3-TETRAMETHYL BUTANE	2233M-C4	594-82-1	114.23
2,2,4-TRIMETHYL PENTANE	224TM-C5	540-84-1	114.23
2,2-DIMETHYL HEXANE	22-DM-C6	590-73-8	114.23
2,3,4-TRIMETHYL PENTANE	234TM-C5	565-75-3	114.23
2,3-DIMETHYL HEXANE	23-DM-C6	584-94-1	114.23
2,4-DIMETHYL HEXANE	24-DM-C6	589-43-5	114.23
2,5-DIMETHYL HEXANE	25-DM-C6	592-13-2	114.23
2-METHYL HEPTANE	2-ME-C7	592-27-8	114.23
3-METHYL HEPTANE	3-ME-C7	589-81-1	114.23

Analytes of Interest

Volatile Compounds

- Trihalomethanes
- Chlorinated Organic Solvents
- Disinfection Byproduct

Analytes of Interest

Semivolatile Compounds

- BNA
- Phenols
- PAH
- Pesticides
- PCBs
- Herbicides

Matrices

- VOC
 - Soils (High level & Low level)
 - Wastes
 - Aqueous
 - Air
- Semi-Vol
 - Soils
 - Waste
 - Aqueous

Equipment & Methodology

En-Core Sampler



Equipment & Methodology

**Pre-cleaned Wide Mouth
4 oz & 8 oz jars**



Equipment & Methodology

**Precleaned 40 mL glass vials
With Teflon lined rubber septa**



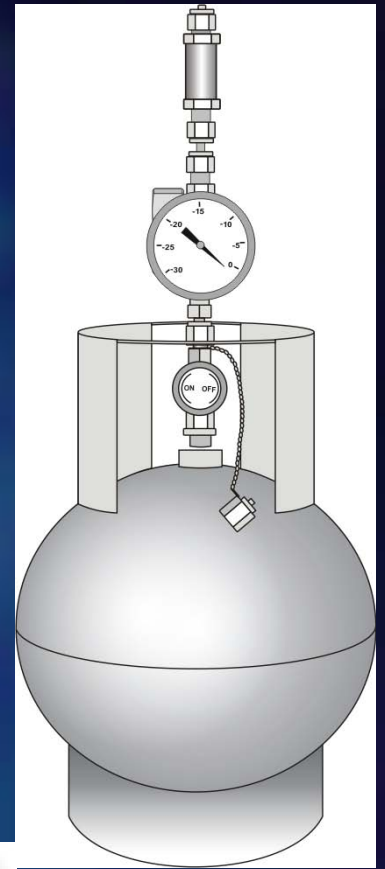
Equipment & Methodology

**Amber 1 Liter Boston
Round Bottles**



Equipment & Methodology

Tedlar Bags & Summa Canister



Analysis

- VOC
 - Gas Chromatography
 - Gas Chromatography/Mass Spectroscopy

Analysis

- VOC
 - Purge & Trap
 - Direct Inject
 - Static Headspace

Analysis

- Semi-Volatile Extraction/Concentration
 - Liquid/Liquid
 - Sonication
 - Soxhlet
 - Zero Headspace Extraction for TCLP

Analysis

- Semi-Volatile
 - Gas Chromatography/Mass Spectroscopy
 - High Performance Liquid Chromatography
 - Liquid Chromatography/Mass Spectroscopy
 - Gas Chromatography/Electron Capture Detector

Instruments



42 STATION RAMAN AUTOSAMPLER



Autosamplers



Instruments



GC

GC/MS

HPLC



Questions?

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