

Air Quality Monitoring

ALS Laboratory Czech Republic offers a wide range of air pollution analysis methods and provide effective service for the highly specialized analytical field of air pollution.

The laboratory is ISO EN/IEC 17025 accredited for air pollution methods.

Over the past century some industry sectors have discharged considerable quantities of gaseous and particulate matter into the environment. The legacy that exists today, is a number of ex-industrial sites and surrounds impacted by chemical contaminants. With increasing environmental awareness and legislation, new technologies have been introduced to monitor emissions and potential harmful effects on the environment.

Sampling methodologies

The sampling of stationery source emissions is a complex procedure due to the variable nature of contaminants and the fact that many pass through a solution without being retained. As a result, sampling trains are utilised where specific solutions are used to collect analytes of concern.

The Right Focus

Analysis of resulting stack solutions requires specific methodologies. Following extensive validation, ALS Czech Republic is able to offer an accredited range of analytical procedures for stationary source emissions based on US EPA, ISO or EN methodologies. These are summarised as follows:

Air Toxic Services

Analytes	Reference
Dioxins (PCDD/F)	EN 1948,2-3, US EPA 23, US EPA TO9A
PCB	EN 1948,4, JIS K 0311
PAH	US EPA 429, US EPA TO 13A, ISO 11338
PBDE	Modified US EPA 1614
Heavy Metals	ISO 17294, ISO 11885
Mercury	US EPA 245.7, US EPA 7474
Chromium VI	US EPA 200.7, ISO 11885
Uranium	US EPA 200.8, ISO 17294-2
Sulfuric acid and SO ₂	EN 14791
Hydrogen halides and halogens	EN 1911-3
Hydrogen sulfide	Internal methodology
Ammonia	Internal methodology
Fluoride	Internal methodology
BTEX	US EPA TO 17
Chlorinated Volatiles	US EPA TO 17
Particulate matter PM <10	US EPA RFPS-094-098
Particulate matter PM <2.5	US EPA RFPS-094-098

Metals emissions from stationery sources

Metals emissions are sampled using an impinger train that collects air drawn isokinetically from a stack sampling point. Particulates are collected on the sampling probe and heated filter. The gaseous load is collected in an acidified hydrogen peroxide solution for all metals except mercury, which is collected in an acidified potassium permanganate solution. Analysis is performed by ICP-OES/MS and AFS (mercury).

The LOQ for typical metals determined by this methodology are the following:

Elements – µg/sample					
Beryllium	0,01	Arsenic	0.05-0.5	Chromium	0.15-0.25
Cadmium	0.025-0.05	Cobalt	0.025-0.1	Lead	0.025-0.5
Mercury	0.001	Nickel	0.25-0.5	Zinc	0.25-1
Thallium	0.025-0.5	Selenium	0.25-0.5	Copper	0.05-0.1
		Tellur	0.25-0.5	Manganese	0.025-0.1
		Chromium VI	0.25	Vanadium	0.05-0.1
				Tin	0.25-0.5

Sulphur dioxide emissions from Stationary sources

Gas samples are collected by bubbling air through a hydrogen peroxide solution. Samples are analysed for SO₂ using a barium-thorin titration method and are reported as mg of SO₂.

HCN, HCL, HF and halogen emissions from Stationary sources

Samples are collected using an impinger train of absorbant solutions, with the use of a pre-filter for determining the particulate load. Samples are analyzed using an ion selective electrode (ISE) or titration. This method of sampling is also often for air quality monitoring in the vicinity of aluminium smelters, power stations, steel works and fertilizer plants.



Hydrogen sulfide emissions from Stationary sources

Samples are collected in a sulfuric acid/silver sulfate solution impinger train and subsequently analyzed by photometry. This method is used for a variety of industries including sulphur recovery plants, fuel gas combustion, etc.

Phenol from Stationary sources

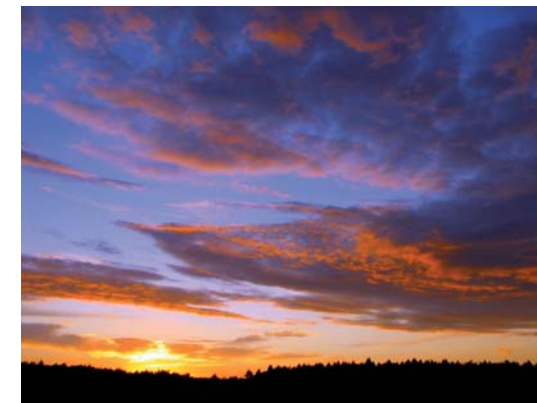
Samples are collected by bubbling air through a sodium carbonates (Na₂CO₃) solution. Samples are analysed by photometry by reaction with 4-aminoantipyrine.



Ammoniac from Stationery sources

Air samples are collected using a solution impinger of sulfuric acid. Samples are analyzed by photometry after distillation. Note: Impinger solution volumes are recorded prior to analysis and are included on the ALS report to enable concentrations to be calculated as mg of analyte per m³.

Volatiles



Samples are collected through sorbent desorption tubes

fulfilled with active carbon. The active carbon is then extracted with carbon disulfide and samples are analyzed by GC/FID or GC/MS.

Thermal desorption sorbent tubes can be used as well. The extraction is then realised by releasing the compounds using high temperature. Compounds are then determined by the same technique (GC/FID or GC/MS).

Poly Aromatic Hydrocarbons (PAH)

Samples are collected through PUF or XAD trap module. The sorbent (XAD or PUF) is the extracted by organic solvents, precleaned by multiplied column chromatographies, and the final extract is analysed by HPLC or by HRGC-HRMS.

Poly Chlorinated Biphenyls (PCB)

Samples are collected through PUF or XAD trap module. The sorbent (XAD or PUF) is the extracted by organic solvents, precleaned by multiplied column chromatographies, and the final extract is analysed by HRGC-HRMS.

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/F)

Samples are collected through PUF or XAD trap module. The sorbent (XAD or PUF) is the extracted by organic solvents, precleaned by multiplied column chromatographies, and the final extract is analysed by HRGC-HRMS.



The Right Support

ALS Global

A global network of 127 locations in 36 countries that is staffed by 5100 capable employees.

ALS Europe

We have 18 locations in 11 countries and more than 400 staff members.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

*Right solutions....
....Right partner*



- HRMS laboratory with two HRGC-HRMS for ultra trace organic analysis in Pardubice, Czech Republic
- Full service environmental laboratories in Prague and Ceska Lipa, Czech Republic
- HR-ICP/MS laboratory equipped with 7 ICP-SFMS (HR-ICP-MS) for Ultra trace elemental analysis in Luleå, Sweden
- Dioxins/SVOC Cartridges Services available in Pardubice
- VOC cartridges Services available in Prague
- Impinger solutions Services available in Ceska Lipa

ALS Network

- Wide range of Air pollution Services in Burlington Canada.
- Ultra trace elemental analysis in Lulea Sweden.

For further information on stationary source emission analysis, please contact your nearest ALS laboratory, or the ALS Europe centre for Air analysis in Czech Republic.

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