

TESTING LABORATORY FOR ENVIRONMENTAL, GMO AND FUEL ANALYSIS

Testing Services, Training & Consulting

(abstract)

The **Testing Laboratory for Environmental, GMO and Fuel Analysis** is accredited according to OEVE/OENORM EN ISO/IEC 17025. The scope of accreditation covers about 180 testing methods and flexible scope for seven testing types. Further information about the scope of accreditation and further services are upon request.

The Umweltbundesamt laboratories perform analyses consistent with the needs of the customers in the following media:

- groundwater, precipitation, deposition
- surface water, suspended solids and sediments
- landfill leachate, indirect discharger, influents and effluents of sewage treatment plants
- sewage sludge, manure and compost
- fertilizers and animal feed
- humus layer and soil
- spruce needles, mosses and other vegetation
- waste, excavation residues and construction and demolition waste
- indoor dust and suspended particulate matter (PM 10 and PM 2,5)
- air – ambient air, indoor air, emissions
- gasoline, diesel and biofuel (FAME), heating oil
- solid recovered fuels
- foodstuff
- consumer goods
- blood, urine, hair, tissue and breast milk
- fish, mussels and other biota

SAMPLING

- development of sampling plans and sampling strategies
- sampling of waste according to ordinance of landfill 2008, annex 4
- sampling of solid recovered fuels according to directive and ordinance of waste incineration (amendment)
- sampling of various inorganic and organic compounds in ambient air and indoor air (e.g. VOC, dioxins, PAH, NH₃, SO₂, NO₂)
- sampling of water, soil, sludge, compost
- sampling of suspended particulate matter
- sampling of fuels according to EN 14275 and EN ISO 3170
- sampling of GMOs
- further sampling upon request

SAMPLE PREPARATION

- drying and lyophilization of solid samples
- grinding, milling and sieving of solid samples (jaw crusher, cutting mill, ultra-centrifuge mill, ball mills, ...)
- preparation of leachates and other extractions
- digestion methods for water samples and various solids (e.g. perchloric acid-, hydrofluoric acid-, aqua regia-digestions, microwave digestion)
- determination of the water content and dry mass at 105°C
- homogenisation of food and feedstuff samples

CHARACTERISATION PARAMETERS

- pH value, electrical conductivity of aqueous and solid samples
- surface tension
- TOC, DOC, total nitrogen content, evaporation residue, alkalinity and carbonate hardness in aqueous samples
- TC, TIC, TOC, nitrogen according to Kjeldahl, total nitrogen content, organic matter by loss on ignition, gross and net calorific value in solid samples
- TC and elemental carbon (EC) in suspended particulate matter samples

INORGANIC (TRACE-)ANALYSIS

- As, Cd, Pb, Hg, Sb in leachates, aqueous and solid samples (AAS)
- Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Se, Si, Sr, Te, Ti, Tl, V, Zn in leachates, sludge, waste, solids, suspended particulate matter and vegetation samples (ICP-AES, ICP-MS)
- platinum group elements (Pt, Pd, Rh) with ICP-MS
- determination of isotopes with ICP-MS (e.g. Pb)
- element screening (ICP-MS)
- ROHS-screening (XRF)
- speciation analysis with HPLC-(CV)-ICP-MS (e.g. Cr VI, methyl-mercury, arsenic species)
- chloride, bromide, bromate, iodide in aqueous samples (IC-ICP-MS)
- ammonium, nitrite and phosphate (spectroscopic methods)
- anions (fluoride, chloride, nitrate, sulfate, bromide, bromate) and cations (ammonium, sodium, potassium, calcium, magnesium) in aqueous leachates, air samples (diffusive samplers, filter packs) and suspended particulate matter (IC)

ORGANIC (TRACE-)ANALYSIS (GC-MS, GC-MS/MS, GC-HRMS, HPLC, LC-MS/MS)

- total content of various organic substances
- qualitative and semi-quantitative screening of various media on organic substances
- screening of various media on mineral oil contaminations
- VOCs in air samples (e.g. aldehydes, alcohols, ketones, esters, terpenes, aromatic compounds)
- VOCs in aqueous and solid samples (e.g. chlorinated hydrocarbons, BTEX, MBTE, ETBE)
- complexing agents (EDTA, NTA, DTPA, 1,3-PDTA)
- phthalates and metabolites
- organic tin compounds
- organic phosphorus compounds and metabolites
- chloroparaffines
- PCDD/F, PCBs (dl-PCBs, indicator PCBs)
- nitro musks and polycyclic musks
- polybrominated diphenylethers
- PAH
- surfactants: anionic surfactants (e.g. LAS, naphthalin sulfonic acids)
non-ionic surfactants and metabolites (e.g. nonylphenol, nonylphenol-ethoxylate)
cationic surfactants (e.g. quaternary ammonium compounds, benzalkoniumchloride)
- nitro-, chloro- and alkyl phenols
- nitro-, chloro- and chloro nitro aromatic compounds
- biocides and disinfectants (e.g. triclosan, triclocarban)
- perfluorinated alkylated substances (e.g. PFOS, PFOA)
- endocrine disrupters (e.g. nonylphenol, bisphenol A), oestrogen hormones
- aliphatic and aromatic amines (e.g. benzidine, azo dyes)
- all POPs according to Stockholm convention
- more than 600 pesticides (e.g. glyphosate, AMPA, lindan, triazine, alachlor, metolachlor), insecticides, fungicides and metabolites
- emerging substances (e.g. benzotriazole, naphthalin sulfonates, acrylamide,...)
- pharmaceuticals (e.g. carbamacepine, caffeine, tetracycline, iopromide, fluoro chinolone, sulfonamide, malachite green)
- nicotine and metabolites
- further parameters upon request

GMO ANALYSIS

- Qualitative and quantitative PCR-analysis of genetically modified organisms in feed, food and environmental media using screening and specific methods.

HUMAN-BIOMONITORING

- Exposition analysis (organic and inorganic (trace) substances), particularly blood, urine, milk, hair, as instrument for evaluation of environmental influence and impact to humans.

FUEL ANALYSIS

Quality controls of diesel, gasoline and biofuel according to following quality standards:

- diesel – EN 590
- gasoline – EN 228
- biofuel (FAME) – EN 14214
- bioheating fuel (FAME) – EN 14213
- vegetable oil as vehicle fuel – DIN V 51605

TRAINING AND CONSULTING

- interpretation of toxicological data
- tender consulting for sustainable procurement – ecological building and renovation
- expert opinion for food stuff according to §73 LMSVG (Austrian Law on Food Safety and Consumer Protection) for contaminants (e.g. PCDD/F and PCB) and residues (e.g. pesticides)
- conception and management of projects
- performance of training courses (e.g. sampling methods & waste control, practical analytical trainings)
- organisation of inter-laboratory comparisons (sampling of waste, soil air/air, AOX in waste water, BTEX and chlorinated hydrocarbons/air samples)
- organisation of topical events

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