
CHEMICAL ANALYTICAL LABORATORY

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At the Slovenian Environment Agency, within the Hydrology and State of the Environment office, Sector Laboratories, there is a Chemical analytical laboratory (CAL), which performs physical and chemical analyses on environmental samples (air, precipitation, water) as a part of the national and international monitoring of air and water quality. The CAL is equipped with professional staff and instruments to analyse basic physical and chemical parameters, trace elements and certain organic pollutants.

MONITORING AMBIENT AIR AND PRECIPITATION QUALITY

The CAL performs analyses of daily ambient air samples at four sampling points in Ljubljana, Maribor, Maribor Urbanski plato and Iskrba at Kočevska Reka, as well as irregular analyses of ambient air samples at different sites all over Slovenia as a part of the ambient air quality monitoring. At these sampling sites, analyses of organic and elemental carbon, polycyclic aromatic hydrocarbons, sugars and their derivatives and trace elements in the PM10 fraction of particulate matter (particles with diameter less than 10 µm), as well as analyses of major anions and cations, organic and elemental carbon and trace elements in the PM2.5 fraction of particulate matter are performed. As a part of the ambient air quality monitoring with diffusion samplers, the CAL prepares Palmes diffusion tubes and performs analyses of nitrogen and sulphur dioxide.

Daily or weekly precipitations are collected at five sampling sites across Slovenia and analysed for pH, electrical conductivity and major anions and cations by the CAL as a part of the precipitation quality monitoring. Weekly precipitation samples from Iskrba at Kočevska Reka are additionally analysed for polycyclic aromatic hydrocarbons and trace elements.

The CAL performs analyses of precipitation, as well as prepares equipment for sampling and performs analyses of sulphur and nitrogen compounds on impregnated filters ("filter pack") and nitrogen dioxide on filters as a part of the EMEP international air quality monitoring (tied to the Convention on Long-Range Transboundary Air Pollution) and the GAW (tied to the activities of the World Meteorological Organisation). These measurements are performed daily at the EMEP station in Iskrba at Kočevska Reka.

MONITORING WATER QUALITY

The CAL performs analyses of TOC (total organic carbon), TN (total nitrogen), ammonium, nitrate, total phosphorus, ortho phosphate, silica, alkalinity and chlorophyll a as a part of the monitoring of chemical and ecological status of lakes.

ACCREDITATION

Since 2003, the CAL is accredited for the chemical testing of environmental samples (particulate matter, water and precipitation) in line with the SIST EN ISO/IEC 17025 standard. The Slovenian accreditation granted the CAL the accreditation certificate No. LP-030.

The current scope of accreditation can be seen at the Slovenian accreditation web site:

<http://www.slo-akreditacija.si/teksti-1/doc/test/LP030.pdf>



ALL ANALYSES PERFORMED BY THE CAL

	Method	Parameter	Matrix
1	Alkalinity		Surface water
2	Ammonium (Spectrophotometer)	NH₄⁺	Surface water
3	Anions (IC)	Cl⁻, SO₄²⁻, NO₃⁻	Precipitation
4	Anions (IC)	NO₃⁻	Surface water
5	Anions (IC)	Cl ⁻ , SO ₄ ²⁻ , NO ₃ ⁻	PM _{2.5} , filter pack
6	Electrical conductivity		Precipitation
7	Elemental analysis	TOC, TN	Surface water
8	Trace elements (ICP-MS)	Cr, Ni, Cu, Zn, As, Cd, Pb	Precipitation
9	Trace elements (ICP-MS)	Al, V, Cr, Mn, Fe, Ni , Co, Cu, Zn, As , Se, Ga, Sr, Mo, Cd , Sb, Pb , Tl	PM₁₀, PM_{2.5}
10	Phosphorus (Spectrophotometer)	PO₄³⁻, TP	Surface water
11	Cations (IC)	K⁺, Na⁺, NH₄⁺, Ca²⁺, Mg²⁺	Precipitation
12	Cations (IC)	K ⁺ , Na ⁺ , NH ₄ ⁺ , Ca ²⁺ , Mg ²⁺	PM _{2.5} , filter pack
13	Chlorophyll a (Spectrophotometer)		Surface water
14	NO ₂ (Spectrophotometer)	NO ₂ ⁻	Air
15	pH		Precipitation
16	Organic and elemental carbon (Combustion with optical correction)	OC, EC	PM ₁₀ , PM _{2.5}
17	Polycyclic aromatic hydrocarbons (PAH) (GC-MS)	Benz(a)anthracene Benzo(b,j,k)fluoranthene Benzo(a)pyrene Indeno(123-cd)pyrene Dibenz(ah)anthracene	Precipitation
18	Polycyclic aromatic hydrocarbons (PAH) (GC-MS)	Benz(a)anthracene Benzo(b,j,k)fluoranthene Benzo(a)pyrene Indeno(123-cd)pyrene Dibenz(ah)anthracene	PM₁₀
19	Silica (Spectrophotometer)	SiO ₂	Surface water
20	Sugars and their derivatives (IC)	Levoglucosan	PM ₁₀
21	SO ₂ and NO ₂ (Diffusion samplers)	SO ₄ ²⁻ , NO ₃ ⁻	Air
22	Suspended solids (Gravimetry)		Surface water
23	Volume of precipitation		Precipitation
24	Sulphur and nitrogen compounds (IC)	SO ₂ , HNO ₃ , NH ₃	filter pack

Accredited methods are **printed in bold**.

