



EA MLA Signatory
Český institut pro akreditaci, o.p.s.
Olšanská 54/3, 130 00 Praha 3

issues

according to section 16 of Act No. 22/1997 Coll., on technical requirements for products, as amended

CERTIFICATE OF ACCREDITATION

No. 379/2023

Vysoká škola báňská - Technická univerzita Ostrava
with registered office 17. listopadu 2172/15, 708 00 Ostrava - Poruba,
Company Registration No. 61989100

for the Testing Laboratory No. 1166
Nanotechnology Centre

Scope of accreditation:

Chemical analysis of drinking, surface, ground and waste water, aqueous extracts, soils, waste, including emissions, immissions, workplace air, sediments, sludge, fuels, oils, building and silicate materials to the extent as specified in the appendix to this Certificate.

This Certificate of Accreditation is a proof of Accreditation issued on the basis of assessment of fulfillment of the accreditation criteria in accordance with

ČSN EN ISO/IEC 17025:2018

In its activities performed within the scope and for the period of validity of this Certificate, the Conformity Assessment Body is entitled to refer to this Certificate, provided that the accreditation is not suspended and the Accredited Body meets the specified accreditation requirements in accordance with the relevant regulations applicable to the activity of an accredited Conformity Assessment Body.

This Certificate of Accreditation replaces, to the full extent, Certificate No.: 210/2022 of 3. 5. 2022, or any administrative acts building upon it.

The Certificate of Accreditation is valid until: **4. 11. 2025**

Prague: 13. 7. 2023



Jan Velfšek
Director of the Department
of Testing and Calibration Laboratories
Czech Accreditation Institute

**The Appendix is an integral part of
Certificate of Accreditation No.: 379/2023 of 13. 7. 2023**

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

Vysoká škola báňská - Technická univerzita Ostrava
CAB number 1166, Nanotechnology Centre
17. listopadu 2172/15, 708 00 Ostrava - Poruba

Testing laboratory locations:

- 1. CNT Laboratories** **17. listopadu 2172/15, 708 00 Ostrava-Poruba**
- 2. IET Laboratories** **17. listopadu 2172/15, 708 00 Ostrava-Poruba**

The laboratory applies a flexible approach to the scope of accreditation.

The current list of activities carried out within the flexible scope is publicly available (e.g. on the laboratory's website <https://ceet.vsb.cz/cnt/cs/nabidka-sluzeb/akreditovana-laborator/> in the form „List of activities within the flexible scope of accreditation“.

The laboratory provides opinions and interprets of test results.

Detailed information on activities within the scope of accreditation (determined analytes/ subject of testing / source literature) is given in the section „Specification of the scope of accreditation“

Tests:

Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Subject of the test	Degrees of freedom ³
1 ¹	Determination of humidity by gravimetry	SOP č. OAA-02-01 (ČSN 72 0102; ČSN EN ISO 17892-1; ČSN EN 12880; ČSN ISO 11465; ČSN 72 1206; ČSN 44 1377; ČSN ISO 579; ČSN ISO 687; ČSN EN ISO 18134-2; ČSN EN ISO 18134-3; ČSN EN 15414-2; ČSN EN ISO 21 660-3)	Soils, sediments, solid waste, solid fuels, building and silicate materials	-
2 ¹	Determination of loss on ignition by gravimetry	SOP no. OAA-02-02 (ČSN 72 0103; ČSN 1744-1+A1; ČSN EN 196-2; ČSN 72 1206)	Soils, sediments, solid waste, solid fuels, building and silicate materials	-
3 ¹	Determination of ash by gravimetry	SOP no. OAA-02-04 (ČSN ISO 1171)	Solid fuels	-
4 ¹	Determination of suspended solids by gravimetry	SOP no. OAA-02-06 (ČSN EN 872)	Surface, ground and waste water	-



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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Subject of the test	Degrees of freedom ³
5 ¹	Determination of dissolved substances and inorganic dissolved salts by gravimetry	SOP no. OAA-02-07 (ČSN 75 7346)	Drinking water, surface, ground and waste water, aqueous extracts	-
6 ¹	Determination of sulphates by gravimetry	SOP no. OAA-02-09 (ČSN EN 1744-1+A1; ČSN EN 196-2; ČSN 72 1206; ČSN 72 0117)	Silicate materials, cement, stone aggregates, gypsum	-
7 ¹	Determination of total sulphur by gravimetry and determination of specific sulphur by calculation	SOP no. OAA-02-10 (ČSN 72 0118; ČSN 44 1379; ČSN EN 1744-1+A1; ČSN 72 0101)	Silicate materials, stone aggregates, solid fuels	-
8 ¹	Determination of carbonate by gravimetry	SOP No. OAA-02-13 (ČSN 72 0121)	Silicate materials, slag, fly ash, gypsum from energy production	-
9 ¹	Determination of insoluble compounds in hydrochloric acid and sodium carbonate by gravimetry	SOP no. OAA-02-12 (ČSN EN 196-2)	Cement	-
10 ¹	Determination of pH by potentiometry	SOP no. OAA-04-01 (ČSN ISO 10523)	Drinking water, surface, ground and waste water and aqueous extracts	-
11 ¹	Determination of electrical conductivity	SOP no. OAA-04-02 (ČSN EN 27888)	Drinking water, surface, ground and waste water and aqueous extracts	-
12 ¹	Determination of Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb and Zn by flame AAS method	SOP no. OAA-05-01A (Manual to the device used; US EPA methods 7000 Series)	Drinking water, surface, ground and waste water and aqueous extracts, acid extracts, emissions – absorption solutions	A, B, D
13 ¹	Determination of Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb and Zn by flame AAS method	SOP no. OAA-05-01B (Manual to the device used; US EPA methods 7000 Series)	Waste, building and silicate materials, emissions – filtration medium	A, B, D
14 ¹	Determination of As, Be, Cd, Co, Cu, Mn, Mo, Ni, Sb, Se and Sn by electrothermal AAS method	SOP no. OAA-05-02A (Manual to the device used; US EPA methods 7000 Series)	Drinking water, surface, ground and waste water and aqueous extracts, acid extracts, emissions – absorption solutions	A, B, D



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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Subject of the test	Degrees of freedom ³
15 ¹	Determination of As, Be, Cd, Co, Cu, Mn, Mo, Ni, Sb, Se and Sn by electrothermal AAS method	SOP no. OAA-05-02B (Manual to the device used, US EPA methods 7000 Series)	Waste, building and silicate materials, emissions – filtration medium	A, B, D
16 ¹	Determination of Hg by analyzer AMA 254	SOP no. OAA-05-04 (Manual to AMA-254)	Drinking water, surface, ground and waste water and aqueous extracts, acid extracts, waste, solid fuels, emissions – absorption solutions and filtration medium	-
17 ¹	Determination of Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sn, Ti, V and Zn by ICP-AES method	SOP no. OAA-06-01A (US EPA method 6010)	Drinking water, surface, ground and waste water and aqueous extracts, acid extracts, emissions – absorption solutions	A, B, D
18 ¹	Determination of Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sn, Ti, V and Zn by ICP-AES method	SOP no. OAA-06-01B (US EPA method 6010)	Waste, building and silicate materials, emissions – filtration medium	A, B, D
19 ¹	Determination of Na, Mg, Al, Si, P, S, K, Ca, Ti, Fe, Mn, Cl, V, Cr, Co, Ni, Cu, Zn, Ga, Ge, As, Se, Br, Rb, Sr, Y, Zr, Nb, Mo, Ag, Cd, In, Sn, Sb, Te, I, Cs, Ba, La, Ce, Ta, W, Hg, Tl, Pb, Bi, Th and U by XRFS method	SOP no. OAA-07-01 (Manual to Spectro Xepos)	Soils, sediments from streams and reservoirs, solid fuels, building and silicate materials, waste from solid fuel combustion, waste from iron production and processing, waste from building materials, dumps from mining activities, emissions - filtration media	A, B, D
20 ¹	Determination of P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, Br, Mo, Ag, Cd, Sn, Ba, Pb by XRFS method	SOP no. OAA-07-02 (Manual to Spectro Xepos)	Liquid and paste waste, oils	A, B, D
21 ¹	Spectrometric determination of phenol index	SOP no. OAA-08-12 (ČSN ISO 6439)	Drinking water, surface, ground and waste water	-
22	Reserved			
23	Reserved			
24	Reserved			



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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Subject of the test	Degrees of freedom ³
25 ¹	Determination of B, Be by ICP-AES method	SOP no. OOA-06-01C (US EPA method 6010; research papers)	Solid fuels	A, B, D
26 ¹	Determination of sulphur and halogens by combustion after decomposition in calorimetric reactor using ion chromatography with conductivity detection	SOP no. OOA-10-05 (US EPA method 5050)	Solid and liquid fuels, solid alternative fuels, biomass, biofuels, waste	-
27 ¹	Determination of anions by ion chromatography with conductivity detection	SOP no. OOA-10-11 (US EPA method 1011B; materials of Waters)	Drinking water, surface, ground and waste water and aqueous extracts, emission – absorption solutions	A, B, D
28 ¹	Determination of concentration of chlorides in solid phase by volumetric method	SOP no. OOA-92-53 (ČSN EN 196-2)	Cement, slag, fly ash	-
29	Reserved			
30 ¹	Determination of C ₁₀ -C ₄₀ hydrocarbons by the method of gas chromatography with FID detector	SOP no. OOA-80-15 (US EPA method 8015C; ČSN EN 14039)	Waste	-
31	Reserved			
32 ¹	Determination of volatile organic compounds by headspace/GC/MS method	SOP no. OOA-38-10 (Manual to CTC CombiPal; US EPA method 3810)	Sediments, waste	A, B, D
33 ²	Determination of polycondensed aromatic hydrocarbons by HPLC/PDA/FLD method	SOP No. OOA-83-10C (US EPA method 8310; US EPA TO 13)	Rinse solutions, filters and solid sorbents from the measurements of emissions, immissions and working environment	A, B, D
34 ²	Determination of volatile organic compounds by gas chromatography method (GC/MS)	SOP No. OOA-82-41C (US EPA method 8240, Manual to Perkin Elmer Thermal Desorber)	Solid sorbents from the measurements of emissions, immissions and working environment	A, B, D
35 ²	Determination of hydrocarbons by gas chromatography method (FID)	SOP No. OOA-80-15C (US EPA metoda 8015C, ČSN EN 14039)	Filters and solid sorbents from the measurements of emissions, immissions and working environment	A, B, D



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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Subject of the test	Degrees of freedom ³
36 ²	Determination of anions by ion chromatography with conductivity detection	SOP č. IET-IC-01 (ČSN EN ISO 10304-1, ČSN EN ISO 10304-3, Application sheets Institute Fondazione Salvatore Maugeri)	Waste water, surface water, aqueous solutions and extracts, absorption solutions, extracts from sorption tubes for sampling - emissions, immissions	A, B, D

¹ asterisk at the ordinal number identifies the tests, which the laboratory is qualified to carry out outside the permanent laboratory premises; the numerical index at the test ordinal number identifies the location carrying out the test (the identification of the locations is given on the first page of this document)

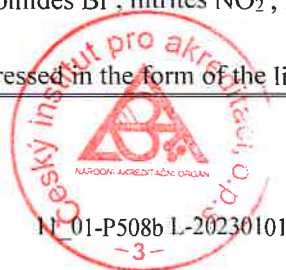
² if the document identifying the test procedure is dated, only these specific procedures are used. If the document identifying the test procedure is not dated, the latest edition of the specified procedure is used (including any changes)

³ degrees of freedom: A – Flexibility concerning materials/products (subject of the test), B – Flexibility concerning components/parameters/characteristics, C – Flexibility concerning the performance of the method, D – Flexibility concerning the method

The laboratory can modify the test procedures with the specified degree(s) of freedom in the scope of accreditation while maintaining the principle of measurement. If no degree of freedom is specified, the laboratory cannot apply a flexible approach to the scope of accreditation for the test.

Specification of the scope of accreditation:

Ordinal test number	Detailed information on activities within the scope of accreditation (determined analytes)
7	The calculation of specific sulphur content applies only to solid fuels
19	Expressed in the form of the elements listed or in the form of oxides: Na ₂ O, MgO, Al ₂ O ₃ , SiO ₂ , P ₂ O ₅ , SO ₃ , K ₂ O, CaO, TiO ₂ , MnO, Fe ₂ O ₃ , BaO, SrO
26	Fluorine, chlorine, bromine, combustible sulphur
27	Fluorides F ⁻ , chlorides Cl ⁻ , nitrites NO ₂ ⁻ , bromides Br ⁻ , nitrates NO ₃ ⁻ , phosphates PO ₄ ³⁻ , sulphates SO ₄ ²⁻
32	Benzene, toluene, ethylbenzene, xylenes, chloroform, trichloroethene, tetrachloroethene
33	Naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[ah]anthracene, benzo[ghi]perylene
34	Benzene, tetrachloromethane, trichloromethane, chloroform, cis-1,2-dichloroethene, 1,1-dichloroethene, ethylbenzene, methylchlorid, styrene, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, xylenes
35	C ₁₀ -C ₄₀ , benzene, toluene, styrene, ethylbenzene, xylenes, trichloroethene, tetrachloroethene
36	Fluorides F ⁻ , chlorides Cl ⁻ , bromides Br ⁻ , nitrites NO ₂ ⁻ , nitrates NO ₃ ⁻ , phosphates PO ₄ ³⁻ , sulphites SO ₃ ²⁻ , sulphates SO ₄ ²⁻ In the case of immission, expressed in the form of the listed anions or in the form of oxides: NO ₂ , SO ₂ .



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Ordinal test number	Detailed information on activities within the scope of accreditation (subject of testing)
12, 13, 14, 15, 16, 17, 18, 19, 27, 33, 34, 35, 36	Emission – waste gas containing pollutants released in a controlled manner or leaking into atmosphere from air pollution sources
33, 34, 35, 36	Immissions: ambient air sampling
1, 2, 13, 15, 16, 18, 19, 20, 26, 30, 32	Waste: solid and liquid waste
3, 7, 25, 26	Solid fuels: black coal, brown coal and coke
1, 16, 19	Solid fuels: biofuel, waste and/or fossil fuel
5, 10, 11, 12, 14, 16, 17, 21, 27, 36	Extracts: aqueous extracts of waste and solid samples, extracts of materials

Specification of the scope of accreditation:

Ordinal test number	Detailed information on activities within the scope of accreditation (source literature)
12, 13, 14, 15, 17, 18, 25	The SOLAAR Series Cookbook, AAS ATI Unicam, US EPA methods, SW 846, Vol.1, Section A, chapter 3, Krakovská, E., Kuss H.M. Rozklady v analytické chemii, VIENALA Košice, 2001
12, 13, 14, 15, 17, 18, 25	Wang, J., Nakazato, T., Sakanishi, K., Yamada, O., Saito, I. Microwave digestion with HNO ₃ /H ₂ O ₂ mixture at high temperatures for determination of trace elements in coal by ICP-OES and ICP-MS. Analytica Chimica Acta. 2004, 1st edition, p. 115-124. Wang, J., Nakazato, T., Sakanishi, K., Yamada, O., Tao, H., Saito, I. Single-step microwave digestion with HNO ₃ alone for determination of trace elements in coal by ICP spectrometry. Talanta. 2006, 5th edition, p. 1584-1590.
32	Instructions for the instrument CTC CombiPal Headspace US EPA methods, SW 846, Vol.1Section B, chapter 4.

Abbreviations and explanations:

AAS	atomic absorption spectrometry
AMA	atomic absorption spectrometry for Hg determination
CNT	Nanotechnology Centre
FD, FLD	fluorescence detector
FID	flame ionization detector
GC/MS	gas chromatography with mass spectrometry detection
HPLC	high performance liquid chromatography
ICP-AES	inductively coupled plasma atomic emission spectroscopy
IET	Institute of Environmental Technologies
PDA	photodiode array detector
US EPA	United States Environmental Protection Agency
XFRS	X-ray fluorescence spectrometry

