



# Price list



## Laboratories Czech Geological Survey

**Head of the Geochemical division and Central laboratories: RNDr. Jan Pašava, CSc.**

### **CGS laboratories offer following services:**

#### **Central laboratory Prague:**

- inorganic determination of rock samples
- inorganic determination of soils
- inorganic determination of unspecified natural materials (wood, potatoes etc.)
- inorganic determination of waters (cations, anions, trace elements)
- **analyses accredited following ČSN EN ISO/IEC 17025:2005**
- consultations of sampling and analytical strategies and procedures
- quantity discounts are negotiable

#### **Specialized laboratories Prague:**

- Isotopic determination of H, C, O, N, S
- Isotopic determination of Sr, Nd, Os, Pb, Li, Cr, Cu, Zn
- Thin section preparation
- Heavy minerals separation
- X-ray powder diffraction
- micropaleontology and chemostratigraphic determination
- electron microscopy and microdetermination

#### **Central laboratory Brno:**

- chemical determination of organic pollutants in the environment, organic component in sediments, rocks, soils, muds and waters
- analyses accredited according to ČSN EN ISO/IEC 17025:2005
- sampling of soils, sediments, waters, gases and building structures
- complex handling and analysis of natural gas and crude oil
- analytical packages according to customer requirements
- consultation of sampling and analytical procedures
- interpretation of analytical results
- volume discounts
- fast processing for additional charge upon request

#### **Sample preparation laboratory Brno:**

- separation of minerals
- retrieving of microfossils

### **Prices do not include VAT.**

All services are delivered by Czech Geological Survey, Klárov 3, 118 21 Praha 1.

VAT identification number CZ00025798.

# CENTRAL LABORATORY PRAGUE

## SAMPLE PREPARATION / SOLID MATERIALS / WATER

Laboratory is accredited following ČSN EN ISO/IEC 17025:2005

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<http://www.geology.cz/extranet-eng/services/laboratories/inorganic-analysis>

## SAMPLE PREPARATION

	Price
<b>100 – Homogenisation</b> Sample preparation for chemical determination: crushing, splitting, pulverization (< 63 µm), homogenization	165 CZK
<b>120 – Sample crushing (jaw crusher)</b>	75 CZK
<b>130 – Dryind and sieving (soft and loose materials)</b>	175 CZK
<b>140 – Splitting and pulverization (&lt;63 µm) (agate box)</b>	95 CZK
<b>150 – Splitting and pulverization (&lt;63 µm) (Mn-steel or WC box)</b>	70 CZK

## SOLID MATERIALS

	Sample load	Det. limit.	Price
<b>301 – Total silicate determination (accredited)</b> Sum of all oxides between: 99.1–100.7 %	5 g	see table	2 370 CZK
<b>302 – Silicate determination simplified (accredited)</b> Sum of all oxides between: 98.3–101.0 %	5 g	see table	1 380 CZK

**303 – Silicate determination technical (accredited)**

5 g

see table

1 280 CZK

Sum of all oxides between: 97.5–101.3 %

element	det. limit. [%] (301)	det. limit. [%] (302)	det. limit. [%] (303)	note
<b>SiO<sub>2</sub></b>	0.1	0.1	0.1	titration
<b>TiO<sub>2</sub></b>	0.01	0.01	0.01	FAAS
<b>Al<sub>2</sub>O<sub>3</sub></b>	0.01	0.01	0.01	Up to 3% by FAAS; above 3% titration
<b>Fe<sub>2</sub>O<sub>3</sub></b>	0.01	0.01	0.01	Up to 10% FAAS; above 10% PMT
<b>FeO</b>	0.03	not detected	not detected	titrace
<b>MgO</b>	0.01	0.01	0.01	Up to 5% by FAAS; above 5% titration
<b>MnO</b>	0.001	0.001	0.001	FAAS
<b>CaO</b>	0.01	0.01	0.01	Up to 5% by FAAS; above 5% titration
<b>Li<sub>2</sub>O</b>	0.001	0.001	0.001	FAAS
<b>Na<sub>2</sub>O</b>	0.01	0.01	0.01	FAAS
<b>K<sub>2</sub>O</b>	0.01	0.01	0.01	FAAS
<b>P<sub>2</sub>O<sub>5</sub></b>	0.005	0.005	0.005	PMT
<b>BaO</b>	0.005	not detected	not detected	ICP-MS
<b>SrO</b>	0.005	not detected	not detected	ICP-MS
<b>CO<sub>2</sub></b>	0.05	not detected	not detected	IR spectrometry
<b>S<sub>tot.</sub></b>	0.01	not detected	not detected	IR spectrometry
<b>H<sub>2</sub>O<sup>+</sup></b>	0.05	0.05	0.05	Calculated – chemically bound water
<b>H<sub>2</sub>O<sup>-</sup></b>	0.05	0.05	0.05	weight loss at 105 °C
<b>C<sub>ost.</sub></b>	0.01	not detected	not detected	IR spectrometry
<b>F<sup>-</sup></b>	0.005	not detected	not detected	ISE
<b>F<sub>ekv.</sub></b>		not detected	not detected	Calculated
<b>S<sub>ekv.</sub></b>		not detected	not detected	Calculated

**304 – Limestone content (accredited)**

2 g

see table

690 CZK

element	det. limit [%]	Note
<b>Fe<sub>2</sub>O<sub>3</sub></b>	0.01	Up to 10% FAAS; above 10% PMT
<b>MnO</b>	0.001	FAAS
<b>MgO</b>	0.01	Up to 5% by FAAS; above 5% titration
<b>CaO</b>	0.01	Up to 5% by FAAS; above 5% titration
<b>CO<sub>2</sub></b>	0.05	coulometry

**305 – Al<sub>2</sub>O<sub>3</sub> by titrimetry (accredited)**

0.5 g

0.01 %

210 CZK

Complexometric titration after acid digestion

<b>306 – CaO by titrimetry (accredited)</b>			
Complexometric titration after acid digestion	0.5 g	0.01 %	114 CZK
<b>307 – Fe<sub>2</sub>O<sub>3</sub> and P<sub>2</sub>O<sub>5</sub> by spectrophotometry (PMT) (accredited)</b>			
<b>Fe<sub>2</sub>O<sub>3</sub></b>			
Determination after acid digestion	0.5 g	0.01 %	85 CZK
<b>P<sub>2</sub>O<sub>5</sub></b>			
Determination after acid digestion	0.5 g	0.01 %	85 CZK
<b>308 – SiO<sub>2</sub> titrimetry (accredited)</b>			
Alkalimetric titration after special acid digestion	0.5 g	0.1 %	360 CZK
<b>309 – SiO<sub>2</sub> by gravimetry (accredited)</b>			
SiO <sub>2</sub> determination in fused sample	0.5 g	0.1 %	366 CZK
<b>310 – FeO determination (accredited)</b>			
Titration by K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> after acid digestion	0.5 g	0.03 %	140 CZK
<b>311 – CO<sub>2</sub> determination (accredited)</b>			
CO <sub>2</sub> infrared spectroscopy after reaction with H <sub>3</sub> PO <sub>4</sub>	1 g	0.01 %	240 CZK
<b>312 – C<sub>tot</sub> determination (accredited)</b>			
Infrared spectroscopy after sample combustion in oxygen	0.5 g	0.01 %	135 CZK
<b>313 – Determination of fluorides (accredited)</b>			
Sample decomposition by catalized pyrolysis, determination with ion-selective electrode	0.2 g	0.01 %	320 CZK
<b>314 – S<sub>tot</sub> determination (accredited)</b>			
Infrared spectroscopy after sample combustion in oxygen	0.5 g	0.01 %	135 CZK
<b>315 – SO<sub>3</sub> by gravimetry (sulphate S, accredited)</b>			
Sample leaching in HCl, precipitation with BaCl <sub>2</sub> , gravimetric determination.	1 g	0.01 %	415 CZK
<b>316 – H<sub>2</sub>O<sup>-</sup> determination (accredited)</b>			
Weight loss after drying at 110 °C	1 g	0.05 %	140 CZK
<b>317 – Loss of ignition (accredited)</b>			
Weight loss after heating to 1 050 °C	1 g	0.05 %	145 CZK
<b>318 – S determination (Eschka procedure) by gravimetry (accredited)</b>			
Determination of sulphur by fusion with Eschka mixture	1 g	0.05 %	515 CZK
<b>319 – MgO by titrimetry (accredited)</b>			
Complexometric titration after acid digestion	0.5 g	0.10 %	103 CZK
<b>341 – Sample dissolution – fusion with KHSO<sub>4</sub></b>			
Removal of organic compounds and SiO <sub>2</sub> , fusion with KHSO <sub>4</sub> , dissolution in H <sub>2</sub> SO <sub>4</sub> .	2.5 g	–	289 CZK

<b>342 – Sample dissolution – fusion with Na<sub>2</sub>O<sub>2</sub></b> Removal of organic compounds, fusion with Na <sub>2</sub> O <sub>2</sub> , dissolution in H <sub>2</sub> O.	2.5 g	–	378 CZK
<b>343 – Sample dissolution – fusion with LiBO<sub>2</sub></b> Removal of organic compounds, fusion with LiBO <sub>2</sub> , dissolution in diluted HCl.	2.5 g	–	246 CZK
<b>344 – Sample dissolution – fusion with Na<sub>2</sub>CO<sub>3</sub></b> Removal of organic compounds, fusion with NaCO <sub>3</sub> , dissolution in diluted HCl	2,5 g	–	296 CZK
<b>345 – Sample dissolution – Acid digestion with HF</b> Silicate sample dissolution with HF, treatment with HClO <sub>4</sub> and H <sub>3</sub> BO <sub>3</sub> mixture, drying and redissolution with HCl	1 g	–	169 CZK
<b>347 – Acid digestion without HF</b> Sample digestion in hot mixture of HCl and HNO <sub>3</sub> .	1 g	–	78 CZK
<b>348 – Decomposition required by a customer</b>			depending on costs
<b>349 – Determination of insoluble residue</b> Sample dissolution by HCl with NH <sub>4</sub> Cl. Insoluble residue is dried and weighted	1 g	–	204 CZK
<b>350 – Determination of n elements by FAAS from dissolved sample (accredited)</b>	1 g	see table	70 CZK (per element)

element	det. limit [ppm]	dissolution method [code]	element	det. limit [ppm]	dissolution method [code]
<b>Ag</b>	0.8	347	<b>Mo</b>	5	345
<b>Be</b>	0.8	345	<b>Ni</b>	5	345
<b>Cd</b>	0.8	345	<b>Pb</b>	10	345
<b>Co</b>	5	345	<b>Rb</b>	2	345
<b>Cr</b>	2	345	<b>Sc</b>	20	345
<b>Cu</b>	2	345	<b>V</b>	15	345
<b>Cs</b>	10	345	<b>Zn</b>	2	345

<b>351 – Determination of n elements by HGFAAS from dissolved sample</b>	1 g	see table	150 CZK (per element)
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element	det. limit [ppm]	dissolution method [code]
<b>As</b>	0.1	347
<b>Bi</b>	0.05	347
<b>Sb</b>	0.05	347

**355 – Determination of n elements by ICP-MS from dissolved sample**

1 g

see table

70 CZK  
(per element)

element	det. limit [ppm]	dissolution method [code]	element	det. limit [ppm]	dissolution method [code]
<b>Ba</b>	1.0	343	<b>Cu</b>	0.1	345
<b>Sr</b>	0.5	343	<b>Mo</b>	0.1	343
<b>Sc</b>	1.0	343	<b>Sn</b>	1.0	343
<b>V</b>	0.5	343	<b>Zn</b>	1.0	343
<b>Cr</b>	0.1	343	<b>Fe</b>	10	343
<b>Ni</b>	0.5	343	<b>Ti</b>	10	343
<b>Ga</b>	0.1	343	<b>Ag</b>	0.1	347
<b>Rb</b>	0.2	343	<b>Bi</b>	0.1	347
<b>Zr</b>	0.2	343	<b>In</b>	0.1	343
<b>Nb</b>	1.0	343	<b>Te</b>	0.5	343
<b>Hf</b>	0.1	343	<b>Ge</b>	0.5	343
<b>Ta</b>	5.0	343	<b>Cd</b>	0.1	343
<b>Pb</b>	0.5	343	<b>Be</b>	1.0	343
<b>Th</b>	0.1	343	<b>Co</b>	0.2	343
<b>U</b>	0.1	343			

Required elements should be specified.

**381 – Au determination**

Leaching from oxidized sample, conversion to non-polar solvent and determination using AAS

30 g

4 mg/t

672 CZK

**382 – Hg determination in solid sample (accredited)**

Pyrolytic decomposition and spectrophotometric determination

0.5 g

0.005 ppm

111 CZK

**384 – REE + 16 trace elements by ICP-MS**

Determination from single dissolved sample; includes REE, Ba, Cr, Ga, Hf, Nb, Ni, Pb, Rb, Sc, Sr, Ta, Th, U, V, Y, Zr; for detection limits see 355 and 385

1 440 CZK

**385 – REE determination (accredited)**

Determination by ICP-MS, includes dissolution fusion with LiBO<sub>2</sub>

1 g

see table

1 056 CZK

element	det. limit [ppm]	element	det. limit [ppm]	element	det. limit [ppm]
<b>La</b>	0.10	<b>Eu</b>	0.02	<b>Er</b>	0.03
<b>Ce</b>	0.10	<b>Gd</b>	0.05	<b>Tm</b>	0.01
<b>Pr</b>	0.02	<b>Tb</b>	0.01	<b>Yb</b>	0.05
<b>Nd</b>	0.30	<b>Dy</b>	0.05	<b>Lu</b>	0.01
<b>Sm</b>	0.05	<b>Ho</b>	0.02	<b>Y</b>	0.10

<b>386 – Decomposition for determination of platinum group elements</b> Nickel-sulphide fire-assay extraction	20g	–	972 CZK
<b>390 – Special determination</b>			Upon request
<b>391 – pH of soil H<sub>2</sub>O leachate</b> Determination by ISE electrode	20g	–	80 CZK
<b>392 – pH of soil KCl leachate</b> Determination by ISE electrode	20g	–	90 CZK
<b>393 – pH of soil BaCl<sub>2</sub> leachate</b> Determination by ISE electrode in 0.1m BaCl <sub>2</sub> leachate	10g	–	78 CZK
<b>394 – Total exchangeable acidity in soil</b> Soil leachate in 0.1 m BaCl <sub>2</sub> , titration by NaOH up to pH 8.2	10g	–	231 CZK
<b>395 – Exchangeable Al in soil</b> Exchangeable Al released after 394 by KF, titration by 0.05M HCl up to pH 8.2.	10g	–	230 CZK
<b>396 – Mehlich III extraction – soil</b> Extraction and P <sub>2</sub> O <sub>5</sub> determination	10g	–	136 CZK

## Waters

			Minimum volume	Det. limit	Price
<b>321 – Total analysis of water (accredited)</b>			500 ml	see table	804 CZK
element	det. limit [ppm]	Note	element	det. limit [ppm]	Note
<b>Ca</b>	0.01	FAAS or ICP-MS	<b>F<sup>-</sup></b>	0.02	ISE
<b>Mg</b>	0.01	FAAS or ICP-MS	<b>Cl<sup>-</sup></b>	0.15	HPIC
<b>Na</b>	0.01	FAAS or ICP-MS	<b>NO<sub>3</sub><sup>-</sup></b>	0.3	HPIC
<b>K</b>	0.01	FAAS or ICP-MS	<b>SO<sub>4</sub><sup>2-</sup></b>	0.5	HPIC
<b>Mn</b>	0.005	FAAS or ICP-MS	<b>NH<sub>4</sub><sup>+</sup></b>	0.02	photometry
<b>Zn</b>	0.01	FAAS or ICP-MS	<b>Alkalinity</b>	0.5	titrimetry
<b>Fe</b>	0.05	FAAS or ICP-MS	<b>pH</b>		ISE
<b>Al</b>	0.2	FAAS or ICP-MS	<b>Conductivity</b>	0.05 μS/cm	Conductometry

### 322 – Determination of n elements in waters by ICP-MS

Sample acidified by HNO<sub>3</sub> (0.5 ml/100 ml)

50 ml

see table

70 CZK  
(per element)

element	det. limit [µg/l]	element	det. limit [µg/l]	element	det. limit [µg/l]	element	det. limit [µg/l]
<b>Al</b>	1	<b>Co</b>	0.05	<b>Mg</b>	10	<b>Sr</b>	0.01
<b>As</b>	0.5	<b>Cr</b>	0.4	<b>Mn</b>	0.1	<b>V</b>	0.2
<b>Ba</b>	0.05	<b>Cu</b>	0.1	<b>Mo</b>	0.1	<b>Zn</b>	0.5
<b>Be</b>	0.02	<b>Fe</b>	10	<b>Na</b>	50		
<b>Ca</b>	50	<b>K</b>	50	<b>Ni</b>	0.2		
<b>Cd</b>	0.04	<b>Li</b>	0.1	<b>Pd</b>	0.1		

Requested elements must be specified.

### 323 – Determination of anions (accredited)

sample not acidified

30 ml

see table

190 CZK

element	det. limit [ppm]	note	element	det. limit [ppm]	note
<b>F<sup>-</sup></b>	0.02	ISE	<b>NO<sub>3</sub><sup>-</sup></b>	0.3	HPIC
<b>Cl<sup>-</sup></b>	0.15	HPIC	<b>SO<sub>4</sub><sup>2-</sup></b>	0.5	HPIC

### 324 – Determination of n elements in waters by FAAS\* (accredited)

sample acidified by HNO<sub>3</sub> (0.5 ml/100 ml)

50 ml

see table

70 CZK  
(per element)

element	det. limit [ppm]	element	det. limit [ppm]	element	det. limit [ppm]
<b>Al</b>	0.2 mg/l	<b>Fe</b>	0.05 mg/l	<b>Pb</b>	0.5 mg/l
<b>Ba</b>	0.1 mg/l	<b>K</b>	0.01 mg/l	<b>Rb</b>	5 µg/l
<b>Ca</b>	0.01 mg/l	<b>Li</b>	2 µg/l	<b>SiO<sub>2</sub></b>	2 mg/l
<b>Cd</b>	0.002 mg/l	<b>Mg</b>	0.01 mg/l	<b>Sr</b>	0.05 mg/l
<b>Co</b>	0.05 mg/l	<b>Mn</b>	5 µg/l	<b>Zn</b>	10 µg/l
<b>Cr</b>	0.002 mg/l	<b>Na</b>	0.01 mg/l		
<b>Cu</b>	0.005 mg/l	<b>Ni</b>	0.05 mg/l		

Required elements should be specified.



<b>325 – Determination of n elements in waters by ETAAS</b>	50 ml	see table	102 CZK (perelement)
sample acidified by concentrated HNO <sub>3</sub> (0.5 ml/100ml)			

element	det. limit [µg/l]	element	det. limit [µg/l]	element	det. limit [µg/l]
<b>Al</b>	10	<b>Co</b>	0.5	<b>Ni</b>	0.5
<b>As</b>	0.5	<b>Cr</b>	0.5	<b>Pb</b>	0.4
<b>Be</b>	0.02	<b>Cu</b>	0.2	<b>V</b>	10
<b>Cd</b>	0.04	<b>Mo</b>	0.5		

<b>326 – NH<sub>4</sub><sup>+</sup> and anions determination (accredited)</b>	50 ml	see table	264 CZK (perelement)
sample not acidified			

element	det. limit [ppm]	note	element	det. limit [ppm]	note
<b>NH<sub>4</sub><sup>+</sup></b>	0.02	photometry	<b>NO<sub>3</sub><sup>-</sup></b>	0.3	HPIC
<b>F<sup>-</sup></b>	0.02	iSI	<b>SO<sub>4</sub><sup>2-</sup></b>	0.5	HPIC
<b>Cl<sup>-</sup></b>	0.15	HPIC			

<b>327 – Determination of n elements in water HGAAS</b>			150 CZK
<b>328 – NH<sub>4</sub><sup>+</sup> determination (accredited)</b>			
Spectrophotometric determination, sample not acidified	20 ml	0.02 mg/l	72 CZK
<b>329 – Alkalinity determination (accredited)</b>			
Titrimetric determination, sample not acidified	100 ml	0.5 mg/l	66 CZK
<b>330 – pH determination</b>			
pH electrode, non-acidified sample	30 ml	2 pH	81 CZK
<b>331 – Conductivity determination (accredited)</b>			
Conductometry with Pt electrodes, sample not acidified	30 ml	8 µS/cm	65 CZK
<b>332 – F<sup>-</sup> in water (accredited)</b>			
ISE electrode, sample not acidified	30 ml	0.02 mg/l	70 CZK
<b>333 – Hg determination</b>			
Spectrophotometric determination, sample acidified (0.5 ml conc. HNO <sub>3</sub> /100 ml sample)	1 ml	0.08 µS/cm	111 CZK
<b>334 – Anions determination by HPLC (accredited)</b>			
sample not acidified	30 ml	see table	120 CZK

element	det. limit	note
<b>Cl<sup>-</sup></b>	0,15	HPIC
<b>NO<sub>3</sub><sup>-</sup></b>	0,3	HPIC
<b>SO<sub>4</sub></b>	0,5	HPIC

<b>335 – Br<sup>-</sup> determination</b> liquid chromatography preparation, sample not acidified	30 ml	0.1 mg/l	216 CZK
<b>336 – J<sup>-</sup> determination</b> ISE electrode, sample not acidified	30 ml	0.15 mg/l	84 CZK
<b>337 – TOC + TN determination</b> sample not acidified; TOC – IR detection; TN – chemiluminiscence	50 ml	–	500 CZK
<b>338 – TOC determination</b> sample not acidified; IR detection	50 ml	0.5 mg/l	390 CZK
<b>339 – TN determination</b> sample not acidified; chemiluminiscence	50 ml	0.05 mg/l	190 CZK
<b>397 – Total P in water</b>	50 ml	6 µS/l	85 CZK
<b>398 – Absorbance at 254 nm</b>	10 ml	–	36 CZK

## SPECIAL LABORATORIES PRAGUE

GRINDERY / MINERALOGY / POWER X-RAY DIFFRACTION / MICROPALAEONTOLOGY AND CHEMOSTRATIGRAPHY / ELECTRON MICROSCOPY AND MICROANALYSIS / RADIOGENIC ISOTOPES / STABLE ISOTOPES

### GRINDERY – THIN AND POLISHED SECTIONS

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<http://www.geology.cz/extranet-eng/services/laboratories/thin-sections/>

	Price (per element)
<b>210 – Thin section of solid sample (2 × 3 cm)</b>	350 CZK
<b>211 – Thin section of solid sample (2 × 3 cm), oriented</b>	370 CZK
<b>220 – Polished thin section for microprobe analysis</b>	640 CZK
<b>230 – Large thin section (3 × 4 cm)</b>	460 CZK
<b>231 – Large thin section (3 × 4 cm) oriented</b>	480 CZK
<b>241 – Polished section for microprobe, columnar, fixed in a synthetic resin, diam. 2,5 cm</b>	580 CZK
<b>242 – Polished section from individual grains for microprobe, columnar, fixed in a synthetic resin, diam. 2,5 cm</b>	690 CZK
<b>243 – Polished section for microprobe, columnar, fixed in a synthetic resin, diam. 3 cm</b>	920 CZK
<b>244 – Polished section for microprobe, columnar, fixed in a synthetic resin, diam. 4 cm</b>	1 150 CZK
<b>250 – Thin section impregnated by a synthetic resin, 2 × 3 cm</b>	460 CZK
<b>251 – Thin section impregnated by a synthetic resin, 3 × 4 cm</b>	580 CZK
<b>252 – Thin section of disaggregatable material or soil</b> (preparation of biological material like shells, teeth, etc.), polished thin section fixed by LAKESIDE, cca 100 µm thick	1 040 CZK
<b>253 – Double polished plate for fluid inclusions study, polished section of zircon grains for estimation of absolute age</b>	2 300 CZK
<b>254 – Large polished section, according size</b>	460 CZK / 1 hour

## MINERAL SEPARATIONS

Mgr. Martin Štrba, phone: +420 251 085 202, e-mail: martin.strba@geology.cz

[www.geology.cz/extranet/sluzby/laboratore/separace/](http://www.geology.cz/extranet/sluzby/laboratore/separace/)

	Price
<b>Heavy mineral separation</b>	
<b>400 – Heavy mineral separation</b> in heavy liquid	640 CZK
<b>Monomineral separation</b>	
<b>401 – Zircon separation</b>	3 350 CZK
<b>402 – Other monomineral separation</b>	230 CZK / operation
<b>403 – Separation of micas (1 g) for K-Ar, Ar-Ar age</b>	1 730 CZK
<b>404 – Magnetic separation before heavy liquid</b>	350 CZK
<b>405 – Separation in tetrabromomethane (2.95 g/m<sup>3</sup>), up to 75 g</b>	350 CZK
<b>406 – Separation in diiodomethane (3.2 g/m<sup>3</sup>), up to 5 g</b>	230 CZK
<b>407 – Magnetic separation after heavy liquid, in case of need repeatedly</b>	230 CZK / operation
<b>408 – Dissolving of sulfides (0.5 g) in hydrogen peroxide (1 l)</b>	350 CZK
<b>409 – Special works (negotiated price)</b>	580 CZK / 1 hour

## OPTICAL MICROSCOPY

RNDr. T. Sidorinová tel.: 251 085 227, e-mail: tamara.sidorinova@geology.cz

[www.geology.cz/extranet/sluzby/laboratore/mikroskopie/](http://www.geology.cz/extranet/sluzby/laboratore/mikroskopie/)

	Price / 1 hour
<b>270 – Semiquantitative analysis of heavy minerals</b> (heavy fraction separation, code 400, is not included)	350 CZK
<b>271 – Sample observation and microphotography in binocular microscope</b>	230 CZK
<b>272 – Sample observation and microphotography in polarizing microscope</b>	350 CZK

## FLUID INCLUSION

RNDr. P. Dobeš, tel.: 251 085 322, e-mail: petr.dobes@geology.cz  
[www.geology.cz/extranet/sluzby/laboratore/fluidni-inkluzi/](http://www.geology.cz/extranet/sluzby/laboratore/fluidni-inkluzi/)

	Price
<b>280 – Fluid inclusions in minerals</b>	
The determination of temperature of homogenization, composition and density of trapped fluids and the interpretation of P-T-V-X data	1 000–1 500 CZK

## POWER X-RAY DIFFRACTION

RNDr. F. Laufek, Ph.D., phone: +420 251 085 210, e-mail: frantisek.laufek@geology.cz  
<http://www.geology.cz/extranet-eng/services/laboratories/x-ray-difraction>

		Price
<b>410 – Data collection (Bragg-Brentano)</b>	(per sample)	300 CZK
<b>414 – Data collection (Debye-Scherrer)</b>	(per sample)	750 CZK
<b>420 – Data evaluation, qualitative phase analysis</b> (single phase sample)*	(per sample)	300 CZK
<b>421 – Data evaluation-oriented clay specimen</b> (air dry and after ethylene glycol treatment)**	(per sample)	600 CZK
<b>422 – Data evaluation, qualitative phase analysis</b> (mixture)*		700 CZK
<b>430 – Data evaluation – (semi)quantitative phase analysis</b> (Rietveld method)*		1 000 CZK
<b>432 – Quantitative analysis calculated from chemical and qualitative phase analysis</b>	(per sample)	1 400 CZK
<b>433 – Data evaluation – (semi)quantitative phase analysis</b> (Rietveld method) including estimate of amorphous phase*		1 100 CZK
<b>460 – Separation of clay fraction and preparation of oriented specimen</b>	(per sample)	650 CZK
<b>470 – Special work</b> (Consultation, microstructural analysis. Crystal structure analysis, specific sample treatments)	1 hour	600 CZK

\* Data interpretation only, data collection (410) not included

\*\* Data interpretation only, data collection (410) and separation of clay fraction (460) not included

## MICROPALAEONTOLOGY AND CHEMOSTRATIGRAPHY

prof. RNDr. Jiří Frýda, Dr., phone: +420 251 085 347, e-mail: [jiri.fryda@geology.cz](mailto:jiri.fryda@geology.cz)

<http://www.geology.cz/extranet-eng/services/laboratories/micropaleontology-chemostratigraphy>

	Price
<b>501 – Laboratory processing of palynological samples</b>	600 CZK
<b>504 – Washing (wet sieving)</b>	600 CZK
<b>506 – Laboratory processing of nanoplankton samples</b>	600 CZK
<b>507 – Special works (development of new techniques)</b>	1 200 CZK 1 hour
<b>508 – Laboratory processing of others micropaleontological samples</b> (accordingly to previous agreement)	1 200 CZK 1 hour
<b>509 – Biostratigraphic analysis</b>	1 200 CZK 1 hour

The price of all analyses have to be consulted with laboratory specialists in advance, as the different types of analyses include even several analytical procedures, which depend on the rock composition of the sample, the weight of the sample and the price of chemicals. Some types of services or analyses can be carried out in parallel, reducing the price per sample.

## ELECTRON MICROSCOPY AND MICROANALYSIS PRAGUE

Mgr. Ondřej Pour, phone: +420 251 085 219, e-mail: [ondrej.pour@geology.cz](mailto:ondrej.pour@geology.cz)

<http://www.geology.cz/extranet-eng/services/laboratories/microprobe-prague>

	Price
<b>700 – Carbon coating (for microanalysis)</b>	200 CZK per sample
<b>710 – Au coating</b>	200 CZK per sample
<b>701 – EDS, WDS analysis, SEI, BEI CL images, EBSD</b>	1 000 CZK/1 hour
<b>707 – Sample surface chemical polishing</b>	800 CZK/1 hour

## THERMAL IONIZATION MASS SPECTROMETRY (TIMS)

John Hora, Ph.D., phone: +420 251 085 336, e-mail: john.hora@geology.cz

Thermo Scientific Triton Plus, [www.geology.cz/extranet-eng/services/laboratories/TIMS/](http://www.geology.cz/extranet-eng/services/laboratories/TIMS/)

	Price
<b>801 – Dissolution of silicate material (HF+HNO<sub>3</sub>, HCl)</b>	500 CZK
<b>802 – Dissolution of carbonate material (HCl)</b>	250 CZK
<b>803 – Dissolution of organic samples</b> (muffle furnace + silicate dissolution)	1 000 CZK
<b>804 – Dissolution of archaeological samples</b> (bone samples, tooth enamel)	500 CZK
<b>809 – Surcharge for complicated samples</b> (i.e. samples that cannot be dissolved using standard procedures)	1 000 CZK
<b>800 – Specialized work</b> (mechanical preparation of samples)	500 CZK/1 hour
<b>811 – Chromatographic separation of Sr</b>	1 g 1 000 CZK
<b>821 – Chromatographic separation of Nd</b>	1 g 1 500 CZK
<b>819 – Surcharge for specialized separation</b> (low concentrations)	1 000 CZK
<b>812 – TIMS analysis Sr (Ta filaments)</b>	1 g 1 100 CZK
<b>822 – TIMS analysis Nd (Re filaments)</b>	1 g 1 600 CZK
<b>825 – <sup>187</sup>Os/<sup>188</sup>Os – TIMS analysis on an chromatographically separated sample*</b>	1 g 2 000 CZK

\* analysis in cooperation with Institute of Geology of the Czech Academy of Science

Please consult with laboratory staff prior to any analyses; at the time of request, provide approximate concentrations of the elements of interest in the samples to be analyzed.

## MULTICollector Inductively Coupled Plasma Mass Spectrometry (MC-ICP-MS)

### High precision measurement of isotopic ratios

RNDr. O. Šebek, Ph.D., tel.: 251 085 307, e-mail: [ondrej.sebek@geology.cz](mailto:ondrej.sebek@geology.cz)

Thermo Scientific Neptune, [www.geology.cz/extranet/sluzby/laboratore/MC-ICP-MS](http://www.geology.cz/extranet/sluzby/laboratore/MC-ICP-MS)

	Price total
<b>830 – Pb isotopes – Environmental and rock samples, purification and separation</b> (separation – 5 550 CZK, measuring – 4 050 CZK)	9 600 CZK
<b>831 – Pb isotopes – Environmental, galenas and rock samples, purification</b> (measuring – 4 050 CZK)	4 050 CZK

<b>840 – Cr isotopes – Water samples, rock samples (fusion of the sample is needed), separation</b>	(separation – 4 050 CZK, measuring – 4 050 CZK)	8 100 CZK
<b>850 – Cu isotopes – Water and rock samples with known matrix, purification and separation</b>	(separation – 4 500 CZK, measuring – 4 050 CZK)	8 550 CZK
<b>860 – Zn isotopes – Water and rock samples with known matrix, purification and separation</b>	(separation – 4 500 CZK, measuring – 4 050 CZK)	8 550 CZK
<b>870 – Li isotopes, minimum 6 samples – Water and rock samples with known matrix, purification and separation</b>	(separation – 3 000 CZK, measuring – 4 050 CZK)	7 050 CZK
<b>870 – Measurement on a Neptune spectrometer (can be offered for batches and scientific projects)</b>		4 600 CZK per hour

## TRADITIONAL STABLE ISOTOPES (H, C, N, O, S)

Ing. Bohuslava Čejková, phone: +420 251 085 346, e-mail: bohuslava.cejkova@geology.cz  
<http://www.geology.cz/extranet-eng/services/laboratories/isotopes-H-C-N-O-S/>

	Price
<b>610 – C and N determination– for isotopic analysis only</b>	400 CZK
<b>611 – <math>\delta^{13}\text{C}</math> determination in solid or liquid organic matter</b>	1 200 CZK
<b>612 – <math>\delta^{13}\text{C}</math>, <math>\delta^{15}\text{N}</math> determination in organic matter</b>	1 800 CZK
<b>613 – C, N content and <math>\delta^{13}\text{C}</math>, <math>\delta^{15}\text{N}</math> determination in organic matter</b>	2 200 CZK
<b>614 – <math>\delta^{13}\text{C}</math> determination in natural gas (1 component)</b>	1 600 CZK
<b>615 – <math>\delta^{13}\text{C}</math> determination in soil gas (1 component)</b>	1 600 CZK
<b>616 – Carbonate removal for determination of <math>\delta^{13}\text{C}</math> in organic matter</b>	160 CZK
<b>617 – Sample preparation for C determination in collagen or cellulose</b>	upon request
<b>618 – Determination of C content and <math>\delta^{13}\text{C}</math> in solid or liquid organic matter</b>	1 400 CZK
<b>621 – <math>\delta\text{D}</math> determination in natural gas (1 component)</b>	2 000 CZK
<b>622 – <math>\delta\text{D}</math> a <math>\delta^{13}\text{C}</math> determination in gas (1 component)</b>	3 400 CZK
<b>631 – <math>\delta^{15}\text{N}</math> determination in organic matter</b>	1 200 CZK
<b>632 – <math>\delta^{15}\text{N}</math> determination in <math>\text{NO}_3</math>, <math>\text{NH}_4</math></b>	1 400 CZK
<b>640 – <math>\delta^{13}\text{C}</math> determination in carbonate (online GasBench)</b>	400 CZK
<b>641 – <math>\delta^{13}\text{C}</math> and <math>\delta^{18}\text{O}</math> determination in carbonate (online GasBench)</b>	500 CZK
<b>642 – <math>\delta^{13}\text{C}</math> and <math>\delta^{18}\text{O}</math> in carbonate (classical method)</b>	900 CZK
<b>643 – <math>\delta^{13}\text{C}</math> and <math>\delta^{18}\text{O}</math> determination in dolomite (classical method)</b>	1 080 CZK



<b>649 – Filtration of the water sample prior to determining <math>\delta\text{D}</math> and <math>\delta^{18}\text{O}</math> in water</b>	50 CZK
<b>650 – <math>\delta\text{D}</math> and <math>\delta^{18}\text{O}</math> determination in water (LGR laser)</b>	350 CZK
<b>651 – <math>\delta^{18}\text{O}</math> determination in water (online GasBench)</b>	400 CZK
<b>652 – <math>\delta^{18}\text{O}</math> determination in sulphate</b>	2 000 CZK
<b>660 – <math>\delta^{34}\text{S}</math> in sulphide</b>	1 000 CZK
<b>661 – <math>\delta^{34}\text{S}</math> in sulphate</b>	1 500 CZK
<b>662 – S separation and <math>\delta^{34}\text{S}</math> determination of various sulphur forms</b>	upon request

Solid samples should be less than very fine sand size.

Analysed samples are stored in laboratory for two months. Only requested samples are returned back. Last samples for analysis and payment must be received until October 30 to be applicable this calendar year. Later samples would be analyzed and payed in next fiscal year.

## LASER ABLATION ICP-MS

### Analyte Excite 193 nm excimer laser, ICP-MS Agilent 7900x

Mgr. J. Míková, Ph.D., tel.: 251 085 329, e-mail: jitka.mikova@geology.cz

Price

<b>751 – U–Th–Pb isotope dating of zircons by LA ICP-MS</b>	22 000 CZK / analytical session
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Please contact the laboratory in advance if you are interested in analytical services and before submitting any samples. Samples for LA ICP-MS analysis needs to be prepared in polished 1" epoxy mounts (no. 253) and their internal structure has to be characterized by CL or BSE imaging (no. 701) prior to analysis.

Price includes analytical session, data reduction (Iolite) and data processing (Isoplot).

## CENTRAL LABORATORY BRNO

WATER / CRUDE OIL / ROCKS AND SEDIMENTS / NATURAL GAS / FIELD MEASUREMENTS / SAMPLING OF SURFACE AND UNDERGROUND WATER / SAMPLING OF SOLID MATERIALS

Laboratory is accredited according to ČSN EN ISO/IEC 17025:2005

**Head of the laboratory:** RNDr. Juraj Franců, CSc., phone: +420 543 429 248, cell phone: 724 158 761, e-mail: juraj.francu@geology.cz

**Deputy head:** ing. Petr Pařízek, phone: +420 543 429 282, e-mail: petr.parizek@geology.cz

**Quality manager:** RNDr. Ludmila Dempírová, CSc., phone: +420 251 085 434, e-mail: ludmila.dempirova@geology.cz

**Accounting department:** Blanka Janíková, phone: +420 543 249 286, e-mail: blanka.janikova@geology.cz

**Sample handling:** Hana Hanušová, Věra Bělíčková, phone: +420 543 429 285, e-mail: hana.hanusova@geology.cz, vera.belickova@geology.cz

**Further info at <http://www.geology.cz/extranet-eng/services/laboratories>**

### Sample processing time

**Total organic carbon (TOC)** 5 days

**Gas chromatography** 10 days

**Gas chromatography with MS detection** 10 days

**Gas analysis** 5 days

**Water analysis** 5 days

Large orders (more than 10 samples) upon request

### Prices

Prices are negotiated individually based on number of samples per set, special requirements, etc.

## WATER AND SEDIMENTS

	Water	Soil, Sediment
<b>901 – pH</b>	28 CZK	–
<b>902 – Conductivity</b> conductometry	33 CZK	–
<b>903 – Total solids in water</b> gravimetry	140 CZK	–
<b>904 – Dissolved solids dried at 105°C (DS 105)</b> <b>or dissolved inorganic salts (DIS)</b> gravimetry	110 CZK	–
<b>905 – Total carbon TC (accredited)</b> combustion / IR detection	–	102 CZK

<b>906 – Total inorganic carbon (TIC) in rock (accredited)</b> acid treatment and IR detection	–	190 CZK
<b>907 – Total sulfur (TS) (accredited):</b> dry combustion / IR detection	–	100 CZK
<b>908 – Total organic carbon (TOC) and inorganic carbon (TIC) (accredited)</b> combustion / acid digestion / IR detection		330 CZK
<b>909 – TOC, TIC, TC and TS (accredited)</b> combustion / acid digestion / IR detection	–	450 CZK
<b>910 – Extractable organic matter (EOM) by gravimetry</b>	–	70 CZK
<b>913 – Non-polar extractable substances (NES) hydrocarbons C<sub>10</sub>–C<sub>40</sub></b> GC-FID	690 CZK	850 CZK
<b>914 – Polycyclic aromatic hydrocarbons (PAHs; accredited)</b> 16 priority, GC-MS	1 250 CZK	1 540 CZK
<b>915 – Polychlorinated biphenyls (PBC), 7 congeners</b> GC-ECD	1 060 CZK	1 290 CZK
<b>916 – Organochlorine pesticides (OCP)</b> GC-ECD	1 060 CZK	1 290 CZK
<b>917 – Polychlorinated biphenyls (PBC) + Organochlorine pesticides (OCP)</b> GC-ECD	1 460 CZK	1 650 CZK
<b>918 – Triazine pesticides</b> LC-DAD	1 435 CZK	–
<b>919 – Phthalic acid esters</b> GC-FID	1 150 CZK	1 150 CZK
<b>920 Volatile organic compounds (VOC)</b> GC-ECD/FID	1 430 CZK	1 650 CZK
<b>921 – Pyrolysis chromatography (Py-GC-FID) basic</b> GC-FID		1 250 CZK
<b>922 – Pyrolysis chromatography (Py-GC-FID) special</b> GC-FID		2 390 CZK
<b>930 – Clay fraction separation (below 2.0 µm)</b>		480 CZK
<b>931 – Superfine- grained fraction separation (below 0.5 µm)</b>		590 CZK
<b>932 – Cation exchange capacity</b> Cu-Trien method		310 CZK

## CRUDE OIL, ROCKS, SEDIMENTS

	Crude oil	Soil, sediment
<b>941 – Crude oil density</b> Gravimetric	50 CZK	–
<b>942 – Total sulphur in crude oil</b>	350 CZK	–
<b>943 – Component analysis of EOH</b> % content of Sat, Aro and NSO fractions, gravimetric	450 CZK	480 CZK
<b>944 – Isoprenoid alkanes and n-alkanes</b> GC-FID	1 490 CZK	1 690 CZK
<b>945 – Aromatic hydrocarbons</b> GC-FID	1 190 CZK	1 390 CZK
<b>946 – Total analysis of crude oil</b>	2 800 CZK	–
<b>947 – Gasoline range hydrocarbons in crude oil</b>	1 800 CZK	–
<b>948 – Biomarkers of saturated hydrocarbons</b> GC-MS	1 370 CZK	1 370 CZK
<b>949 – Biomarkers of aromatic hydrocarbons</b> GC-MS	1 370 CZK	1 370 CZK

## GAS ANALYSIS

	Gas
<b>961 – Basic gas composition (accredited)</b> Determination of CO <sub>2</sub> , CO, O <sub>2</sub> , N <sub>2</sub> , CH <sub>4</sub> , He, GC-TCD	1 300 CZK
<b>962 – Extended gas composition (accredited)</b> Determination of He, H <sub>2</sub> , CO <sub>2</sub> , Ar, O <sub>2</sub> , N <sub>2</sub> , CH <sub>4</sub> , CO, 2 isomers of C <sub>2</sub> , 2 isomers of C <sub>3</sub> , iC <sub>4</sub> , nC <sub>4</sub> , 4 isomers of C <sub>5</sub> , 2 isomers of C <sub>6</sub> ; GC-FID/TCD	1 600 CZK

## FIELD MEASUREMENTS

<b>971 – Soil gas measurements, VOC, methane, CO<sub>2</sub></b> ECOPROBE-5	2 450 CZK / 1 day
<b>972 – Sampling of ground, mine, waste and soil gas into sampling containers (accredited)</b>	300 CZK

## SAMPLING OF SURFACE AND GROUNDWATER

<b>981 – Static sampling</b> surface or defined depth	350 CZK
<b>982 – Dynamic sampling</b> sampling in steady flow regime	1 600 CZK

## SOLID MATERIAL SAMPLING

<b>991 – Waste sampling</b> representative samples	400 CZK
<b>992 – Soil and mud sampling</b>	300–600 CZK
<b>993 – Mud sampling</b>	200–300 CZK
<b>994 – Stream sediment sampling</b>	300–2 500 CZK
<b>995 – Building constructions sampling</b>	250–2 000 CZK
<b>996 – Core drilling</b> Diameter 56–100 mm (price per 1 m)	400–500 CZK

\* Cena stanovena dohodou podle dostupnosti a časové náročnosti.

## SAMPLE PREPARATION LABORATORY BRNO

Mgr. Irena Sedláčková, phone: +420 724 767 432,  
e-mail: irena.sedlackova@geology.cz

	Max. sample weight	Price
<b>161 – Rock disruption</b> breaking by a hammer to the fragments about 3 × 3 cm	5 kg	90 CZK
<b>162 – Cutting of the rock</b> cutting of the rock using a circular saw at the request of the client	not specified	90 CZK
<b>163 – Rock crushing</b> rock crushing on jaw crusher	5 kg	180 CZK
<b>164 – Control sample</b> saving of rock sample into the box	100 g	60 CZK
<b>165 – Granulometry in range 0.063mm – 20 mm</b> sample drying, wet sieving on 3 to 5 sieve set, drying, weighing, output diagram	500 g	350 CZK
<b>166 – Sample preparation for geochemical analysis</b> rock disruption, control sample, repeated crushing using jaw crusher, homogenization	3 kg	400 CZK
<b>167 – Washing of un lithified rocks for micropaleontology on sieves</b> clay, marl, sand, dust	800 g	240 CZK
<b>168 – Disintegration and washing lithified rocks for mickropaleontology</b> claystone, marlite, slate	300 g	360 CZK
<b>169 – Acetolysis following the method of Lirer (2000)</b> limestone	250 g	380 CZK
<b>170 – Acid decomposition</b> document sample, dissolution in hydrochloric acid, wet sieving, drying, weighing	400 g	350 CZK
<b>171 – Pebble analysis</b> preparation, wet sieving, sieves according to the client	2 kg	90 CZK
<b>172 – Sample preparation for heavy mineral separation</b> crushing*, wet sieving – fraction 0.063 – 0.250 mm, drying	2 kg	160 CZK
<b>173 – Heavy mineral separation</b> separation in LST (liquid sodium heteropolytungstate)	40 g	500 CZK
<b>174 – Sample preparation and heavy mineral separation</b> include 172 and 173, does not include rock crushing	2 kg	640 CZK

## SPECIAL WORKS

<b>175 – Electromagnetic separation</b> heavy minerals sorting into fractions on the Cooch electromagnetic separator	50 g	300 CZK
<b>176 – Shaking table</b> sample dividing into four density fractions	2 kg	1 800 CZK
<b>177 – Sample preparation for dating</b> rock disruption, crushing using jaw crusher, dry sieving, wet separation on shaking table, electromagnetic separation, separation of heavy minerals in LST (except hand selection and microprobe)	10 kg	2 880 CZK
<b>178 – Sample preparation for dating – hand selection</b> pick out of one heavy mineral type from the residue, marking, picking and fixing on adhesive tape, hand over to the Grindery of Masaryk University Brno**	1 g	1 200 CZK
<b>179 – Preparation for laser ablation</b> hand over to microprobe***, data processing, preparation of grains for laser ablation	1 sample	360 CZK
<b>180 – Sample preparation for dating – whole procedure</b> includes 177, 178, 179	10 kg	4 000 CZK

\* when done, the item is charged separately

\*\* does not include the pellet price

\*\*\* does not include the price of microprobe

Possibility of quantity discount upon agreement with the Head of department.



CZECH  
GEOLOGICAL  
SURVEY

# Where to find us:

## Laboratories in Prague



Czech Geological Survey

Address: Geologická 6  
152 00 Praha 5  
Tel.: +420 251 085 111

## Laboratories in Brno



Czech Geological Survey

Address: Leitnerova 22  
658 69 Brno  
Tel.: +420 543 429 200

<http://www.geology.cz/extranet-eng/services/laboratories>