

## Vyhodnocení vzorků z archeologického průzkumu

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<b>Datum:</b>	15. dubna 2023

## Seznam vzorků a analýz

Číslo vzorku	Lokalita	Bližší označení	Provedená analýza
1	Bystrý potok	frita	XRD, XRF, SEM
2	Kunčice Huťářství	pánve	XRD, SEM
3	Bystré (Bystrý potok)	pánev, jíł	XRD, SEM
4	Kunčice Huťářství	frita	XRD, XRF
5	Bez označení	Bez označení	XRD
6	Bez označení	Bez označení	XRD
7	Bystrý potok, Kunčice p.O.	Jíl pánvový	XRD
8	Kunčice p. O.	sklo, úkap od píšťaly	EDAX, SEM
9	Bystré	Sklo, úkapy, baroko	XRF, SEM
10	Kunčice, Huťářství	surovina / barvivo	XRD
Bez čísla	Bystré	okenní terčík	EDAX

### Provedené analýzy a jejich zkratky

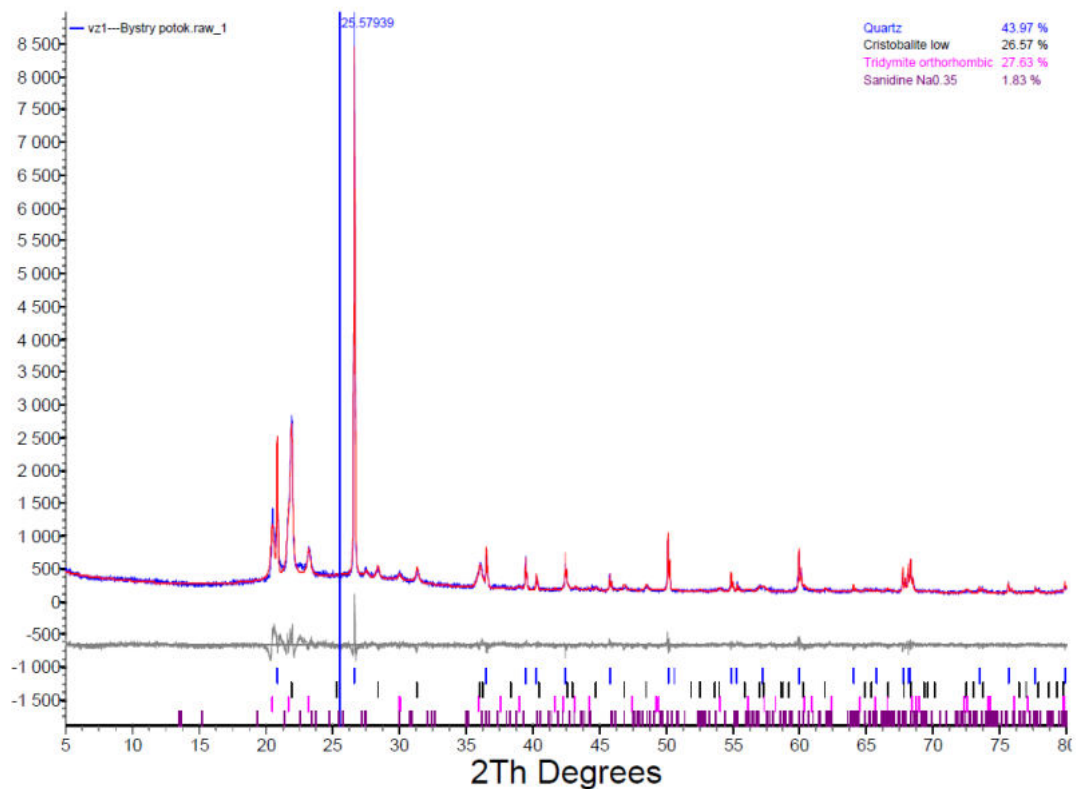
XRD semikvantitativní fázová analýza RTG difrakcí

XRF chemická analýza RTG fluorescencí

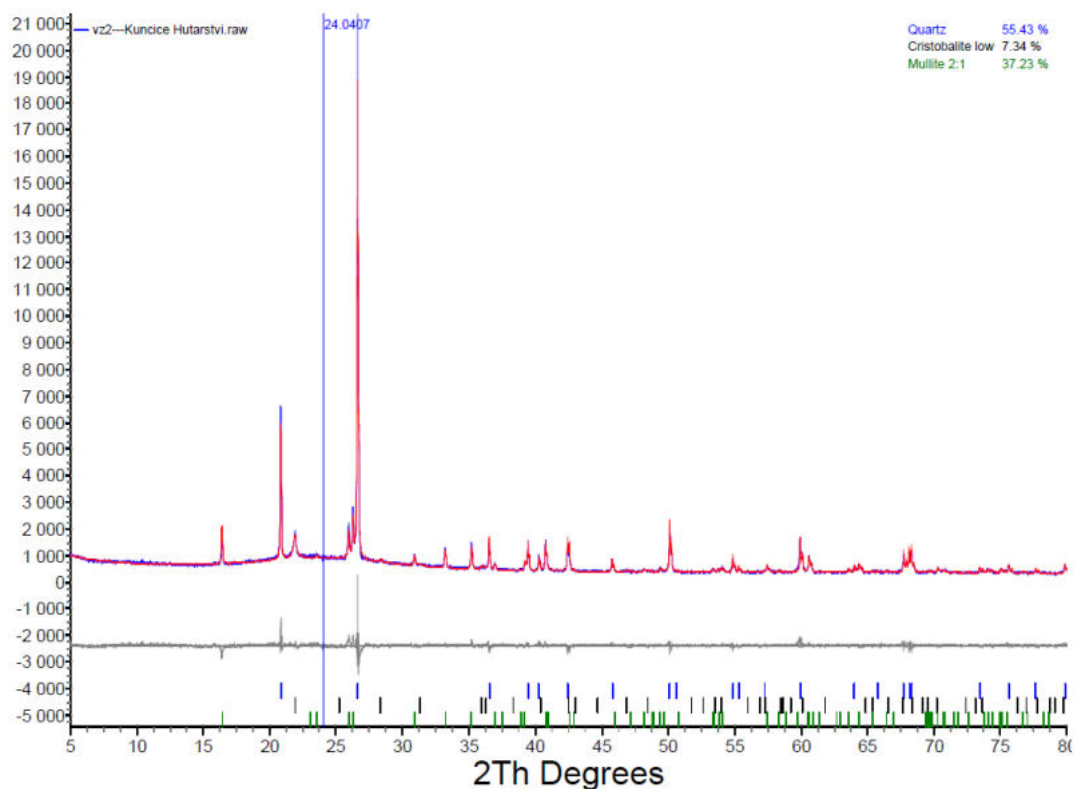
SEM elektronová mikroskopie

EDAX bodová analýza, použita pro vzorky v malém množství, nedostatečném pro XRF

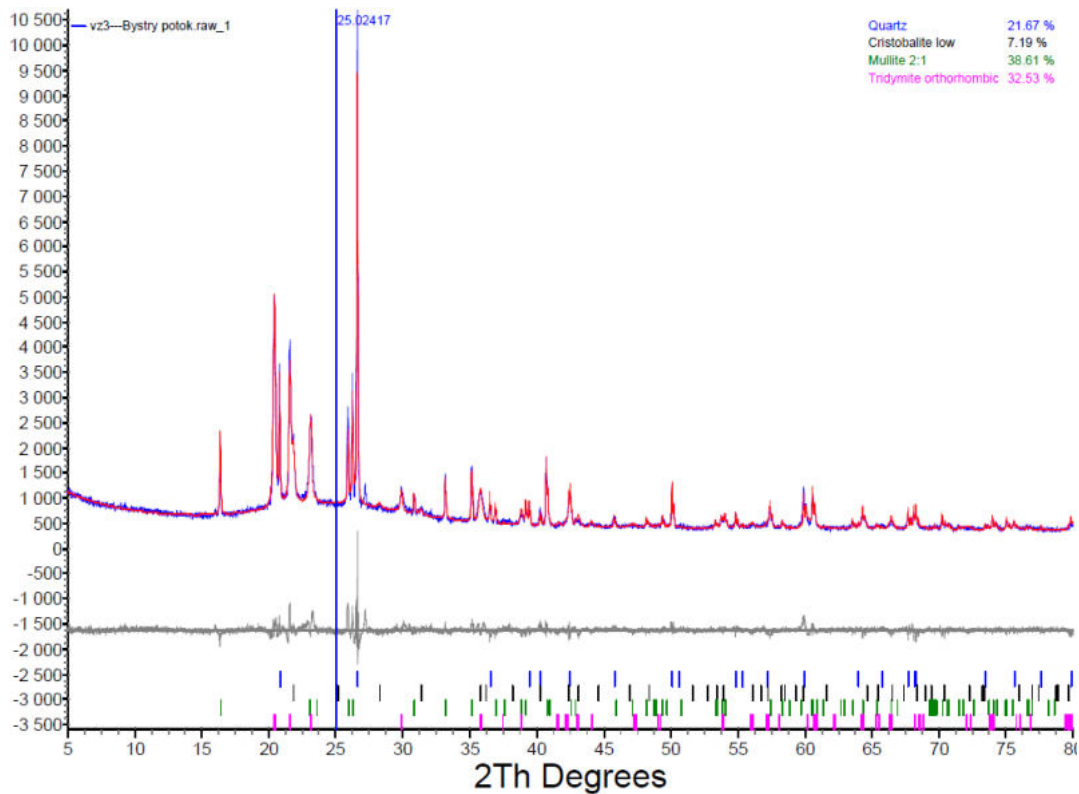
# 1 Fázová analýza metodou RTG difrakce



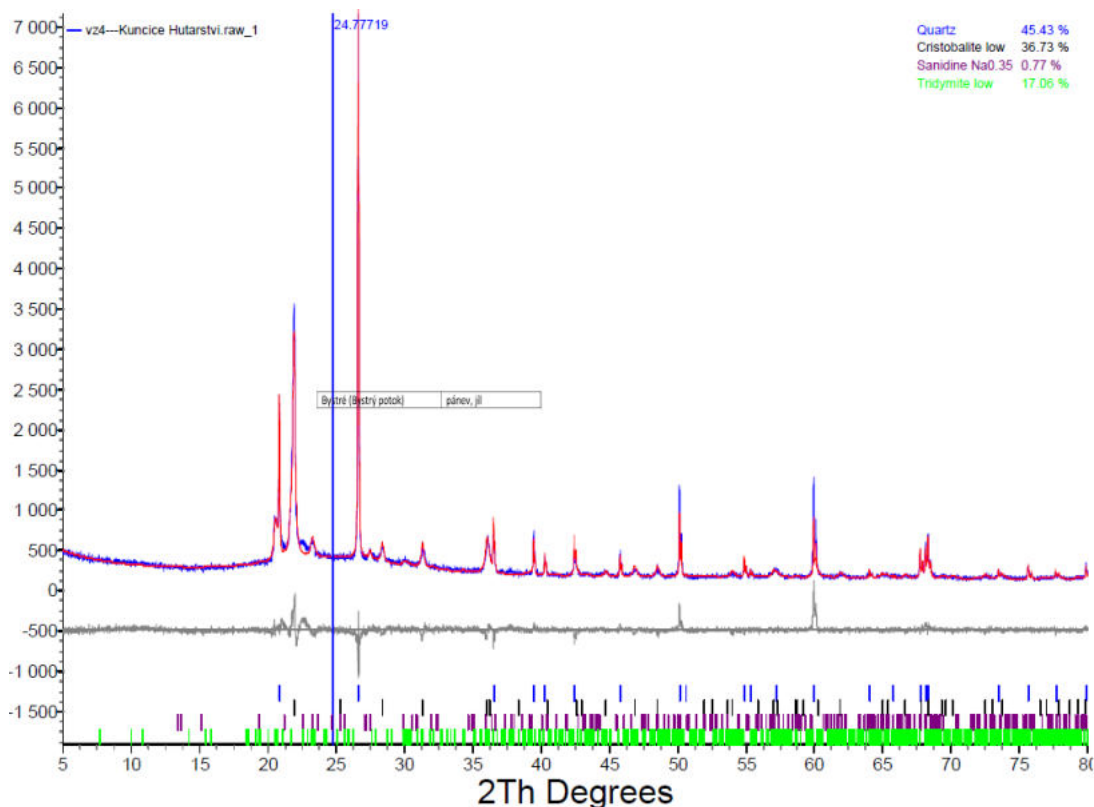
Vzorek 1 Bystrý potok, frita: křemen 18%, cristobalit 26,6 %, tridymit 27,6 %, sanidin 1,8 %



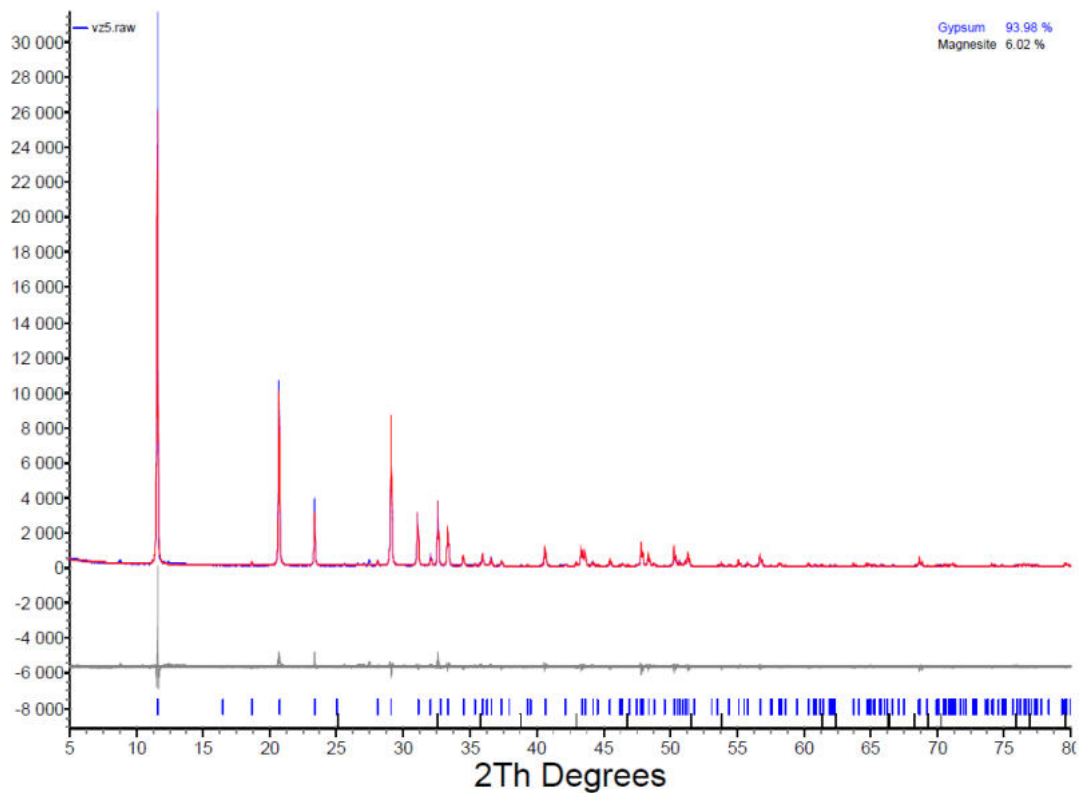
Vzorek 2 Kunčice Hutářství, pánve: křemen 55,4 %, cristobalit 7,3 %, mullit 37,2 %



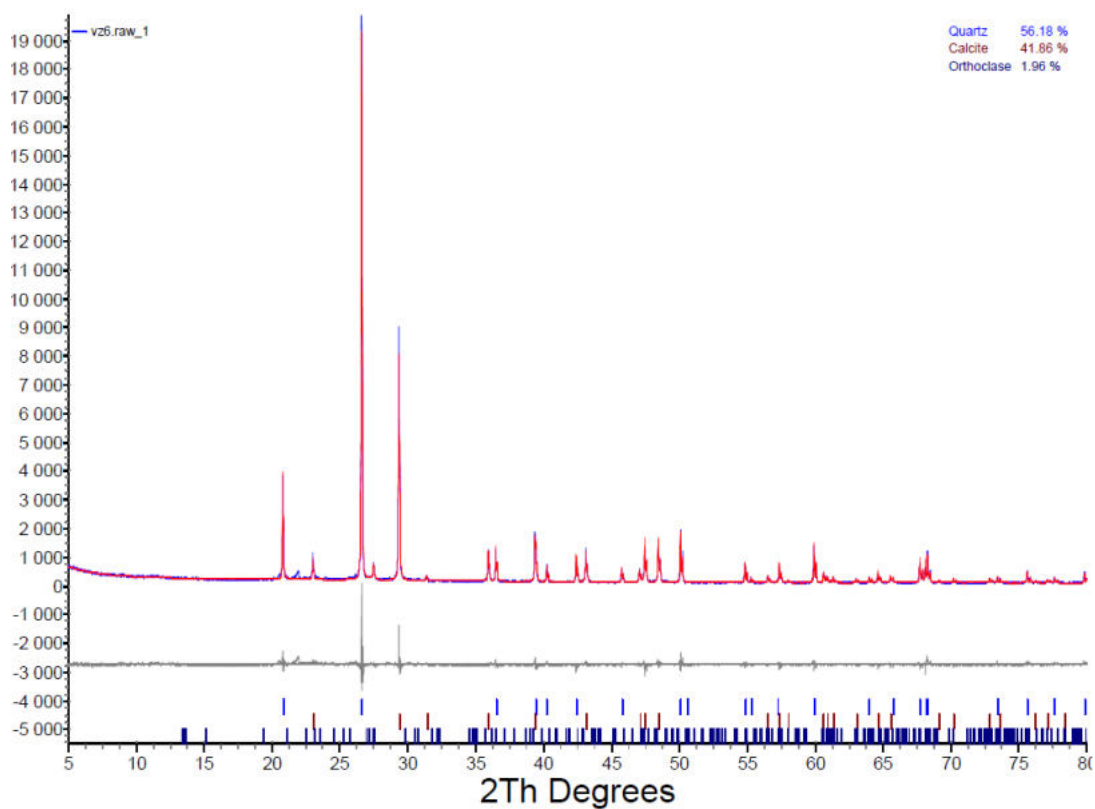
**Vzorek 3 Bystré (Bystrý potok), pánev, jíł: křemen 21,7 %, cristobalit 7,2 %, mullit 38,6 %, tridymit 32,5 %**



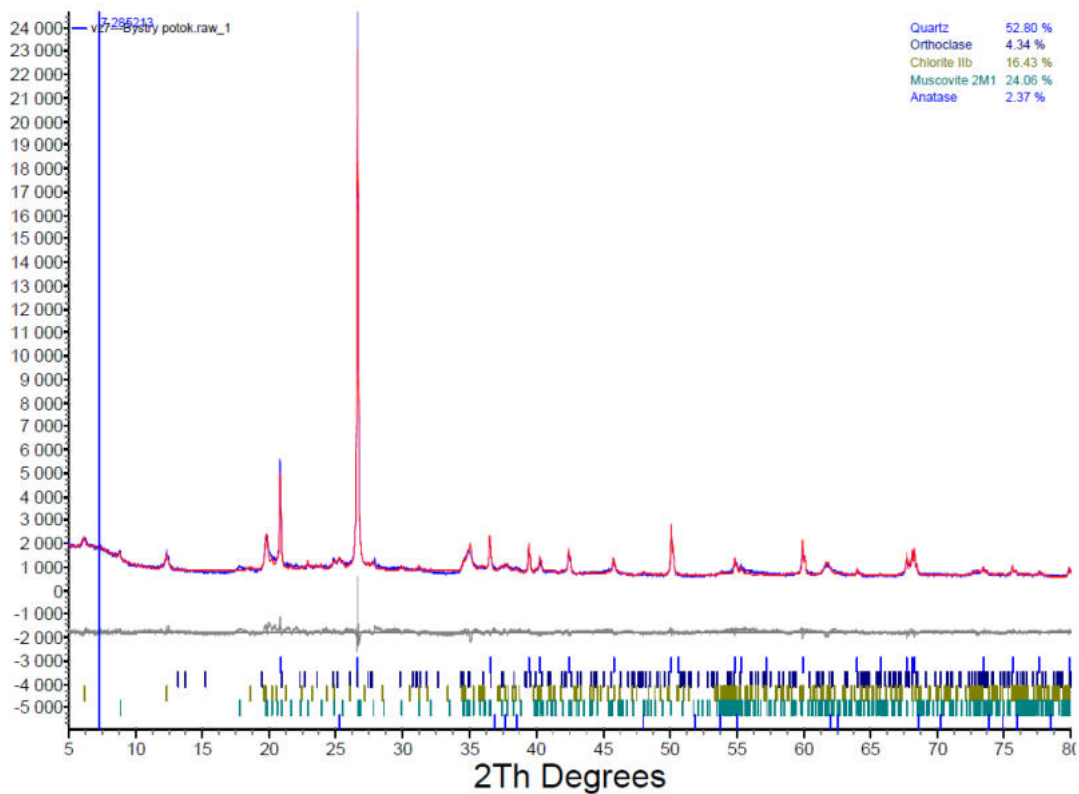
**Vzorek 4 Kunčice Hutářství, fritá: křemen 45,4 %, cristobalit 36,7 %, sanidin 0,8 %, tridymit 17 %**



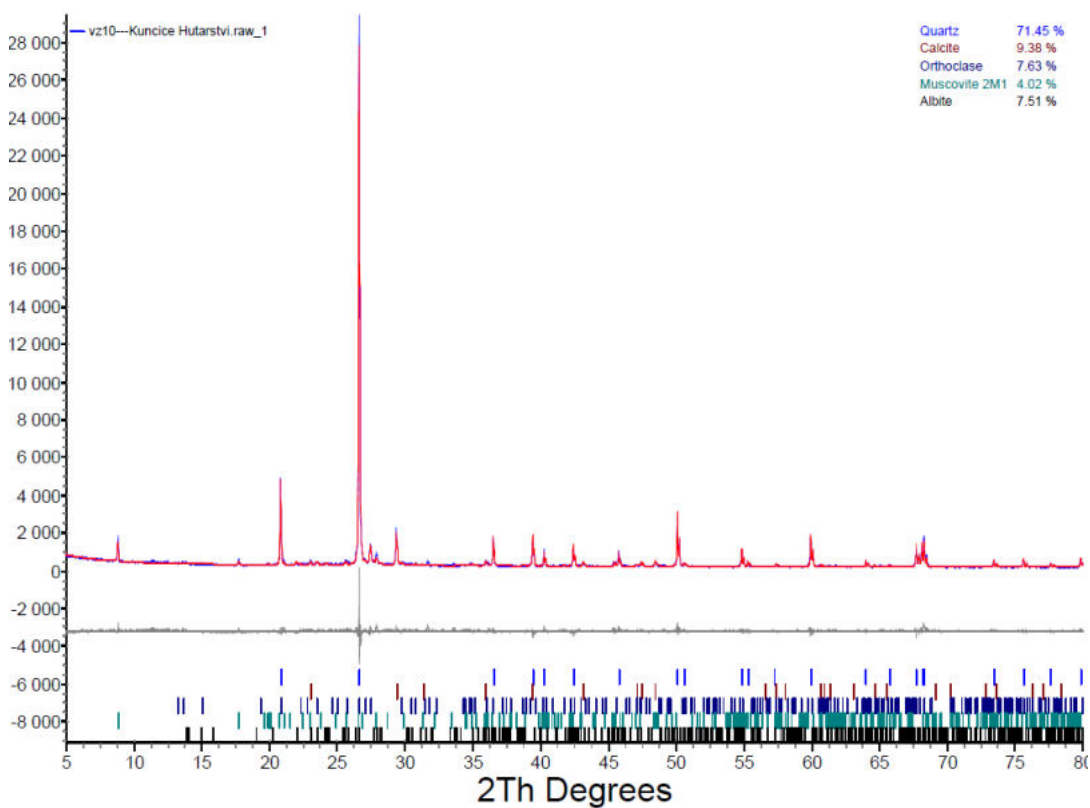
**Vzorek 5 bez označení: sádrovec 94 %, magnezit 6 %**



**Vzorek 6 bez označení: křemen 56,2 %, kalcit 41,8 %, ortoklas 2 %**



**Vzorek 7 Bystrý potok, Kunčice p.O., jíl pánvový: křemen 52,8 %, ortoklas 4,3 %, chlorit 16,4 %, muskovit 24,1 %, anatas 2,4 %**



**Vzorek 10 Kunčice, Huřařství, surovina / barvivo: křemen 71,5 %, kalcit 9,4 %, ortoklas 7,6 %, muskovit 4 %, albit 7,5 %**

## 2 Chemická analýza RTG fluorescencí

analyt	1	4	9
Na <sub>2</sub> O	0,21%	0,41%	0,20%
MgO	0,55%	0,47%	2,10%
Al <sub>2</sub> O <sub>3</sub>	4,57%	3,91%	1,23%
SiO <sub>2</sub>	81,4%	85,2%	58,9%
P <sub>2</sub> O <sub>5</sub>	0,20%	0,14%	1,09%
SO <sub>3</sub>	0,04%	0,04%	0,19%
K <sub>2</sub> O	7,25%	4,71%	17,0%
CaO	2,05%	2,18%	12,3%
TiO <sub>2</sub>	0,20%	0,12%	0,09%
MnO	0,11%	0,10%	0,60%
Fe <sub>2</sub> O <sub>3</sub>	1,07%	0,78%	0,51%
Cr (PPM)	29	<10	<10
Ni (PPM)	13	<10	30
Cu (PPM)	22	13	80
Zn (PPM)	25	26	201
Rb (PPM)	119	77	224
Sr (mg/kg)	101	117	417
Zr (PPM)	64	51	58
Ba (PPM)	472	624	1504
Pb (mg/kg)	46	45	74
Ce (PPM)	14	13	13

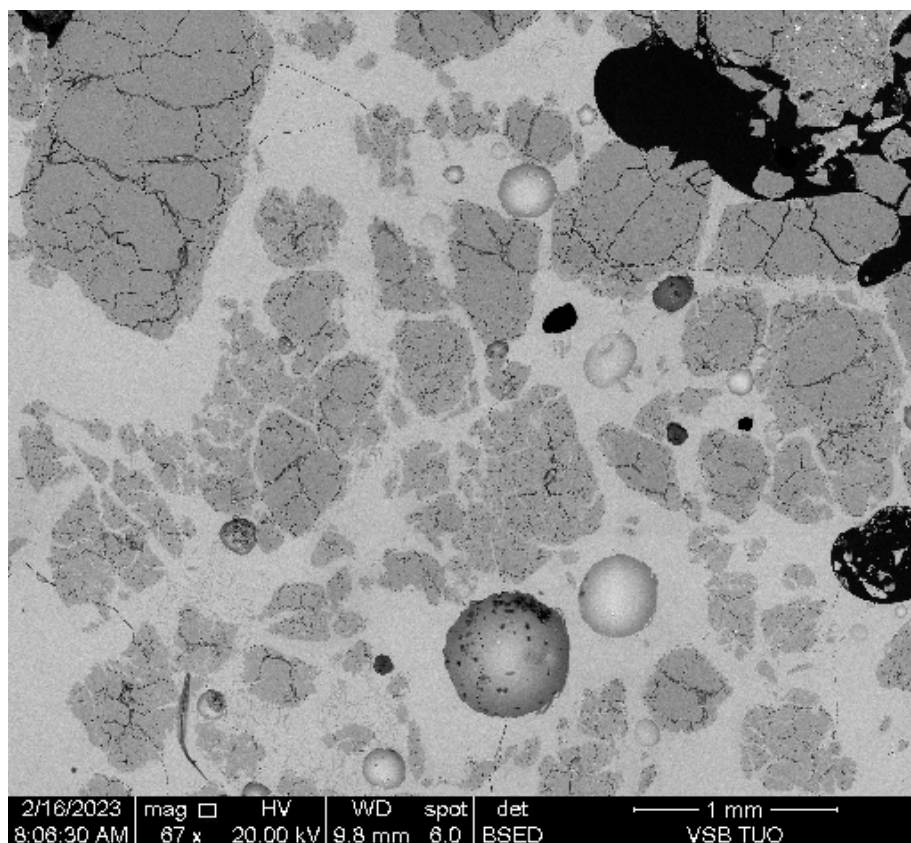
1 Bystré (Bystrý potok) fritá

4 Kunčice - Huřařství fritá/pánev?

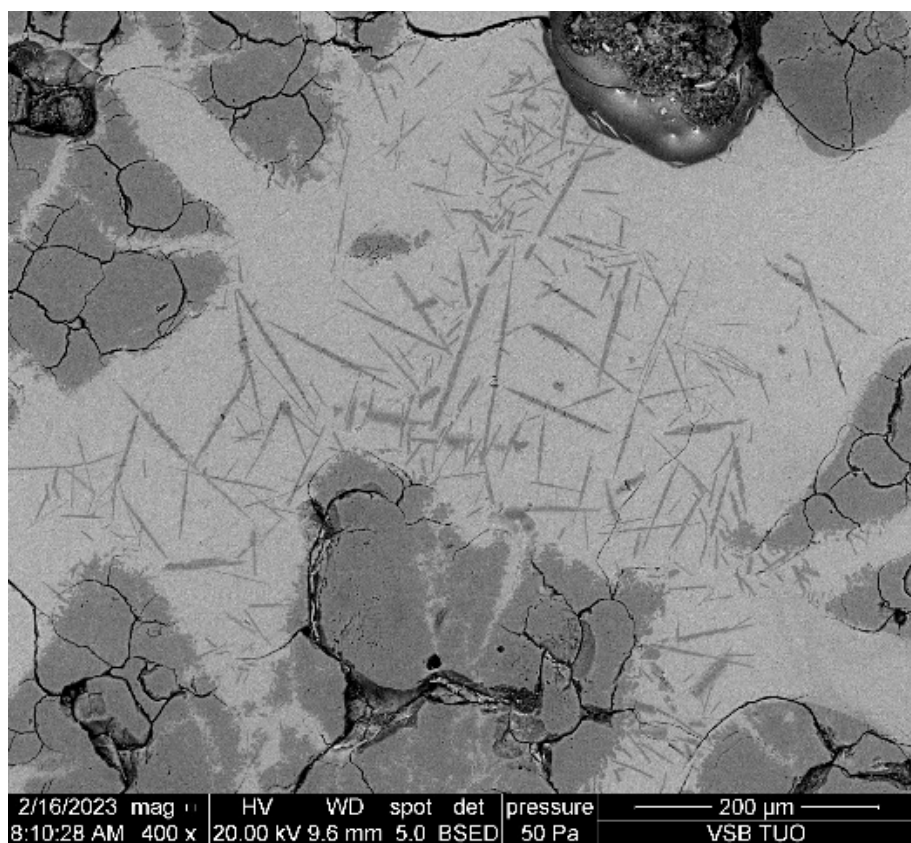
9 Bystré (Bystrý potok) sklo, úkapy - baroko?

### 3 Elektronová mikroskopie (zvětšení udává měřítko v pravé dolní části snímku).

#### Vzorek 1

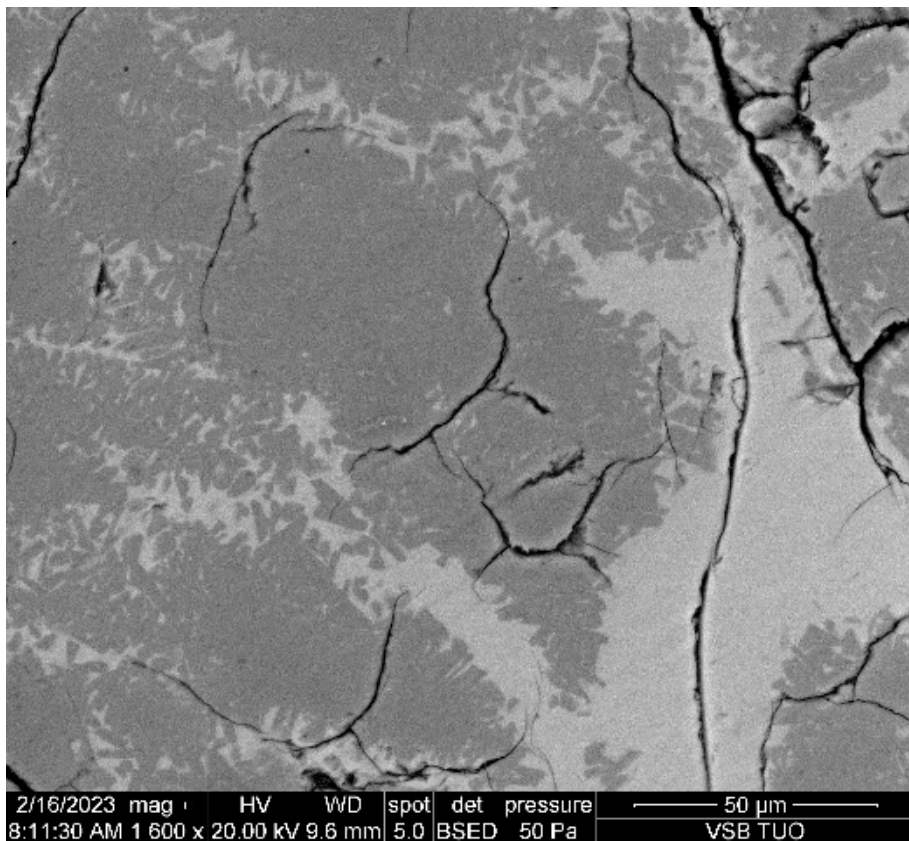


#### Krystaly $\text{SiO}_2$ ve skle a póry.



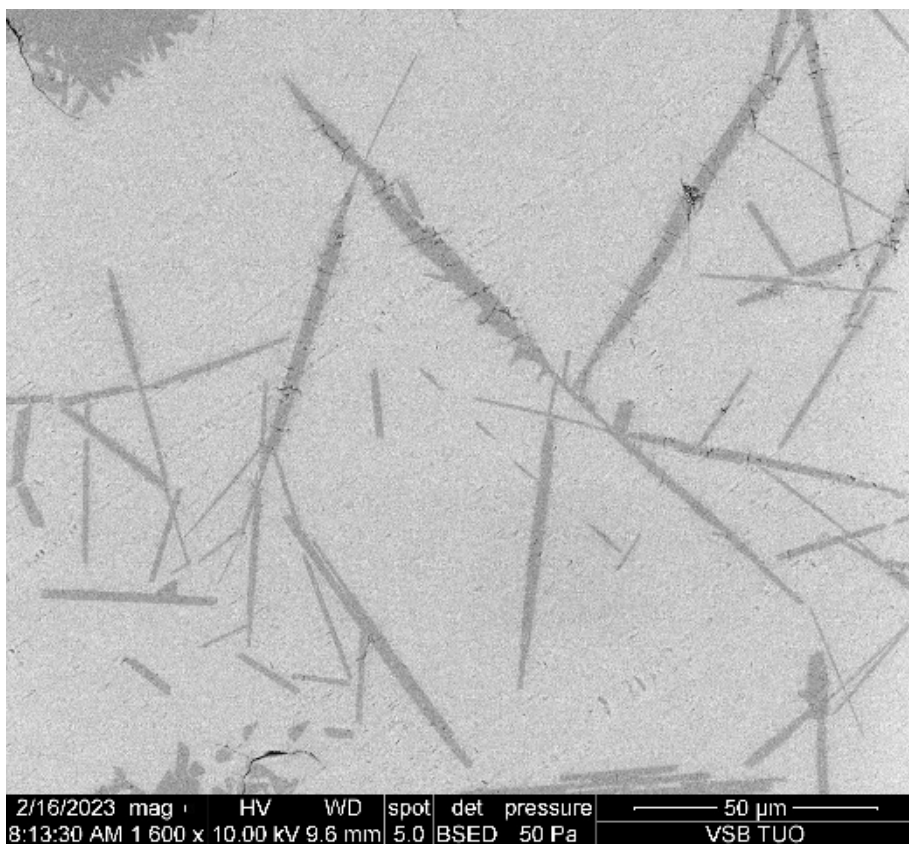
#### Krystaly $\text{SiO}_2$ ve skle a póry.





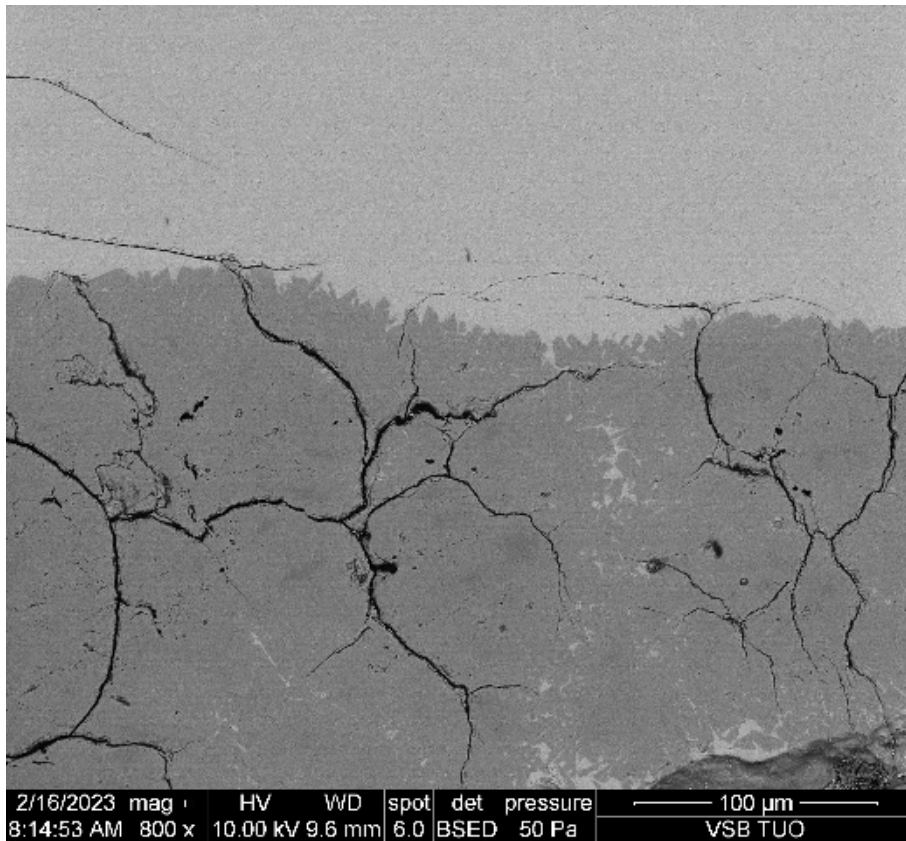
2/16/2023	mag	HV	WD	spot	det	pressure	50 $\mu$ m
8:11:30 AM	1 600 x	20.00 kV	9.6 mm	5.0	BSED	50 Pa	VSB TUO

Krystaly  $\text{SiO}_2$  ve skle a póry.

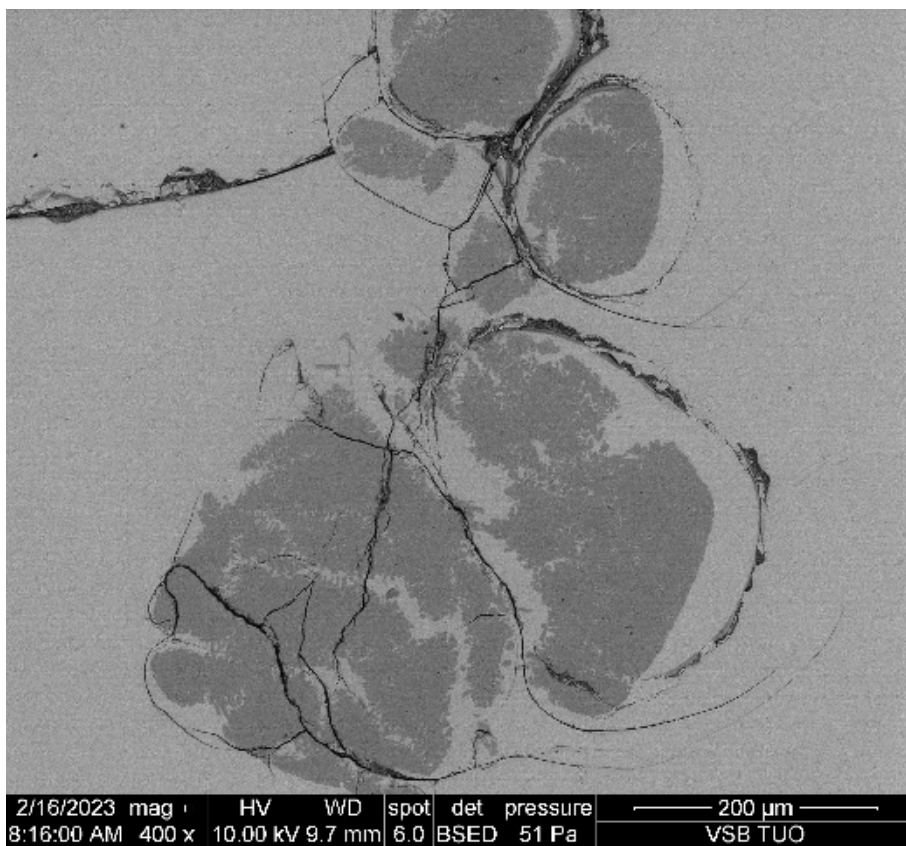


2/16/2023	mag	HV	WD	spot	det	pressure	50 $\mu$ m
8:13:30 AM	1 600 x	10.00 kV	9.6 mm	5.0	BSED	50 Pa	VSB TUO

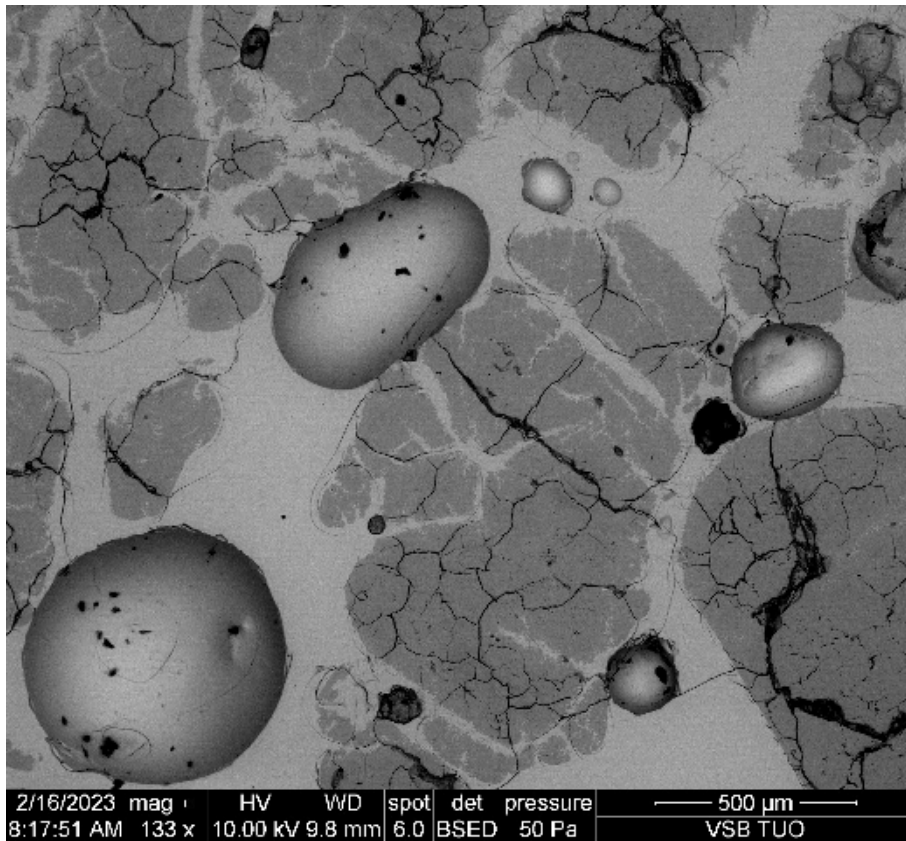
Krystaly  $\text{SiO}_2$  ve skle a póry.



Krystaly SiO<sub>2</sub> ve skle a póry.

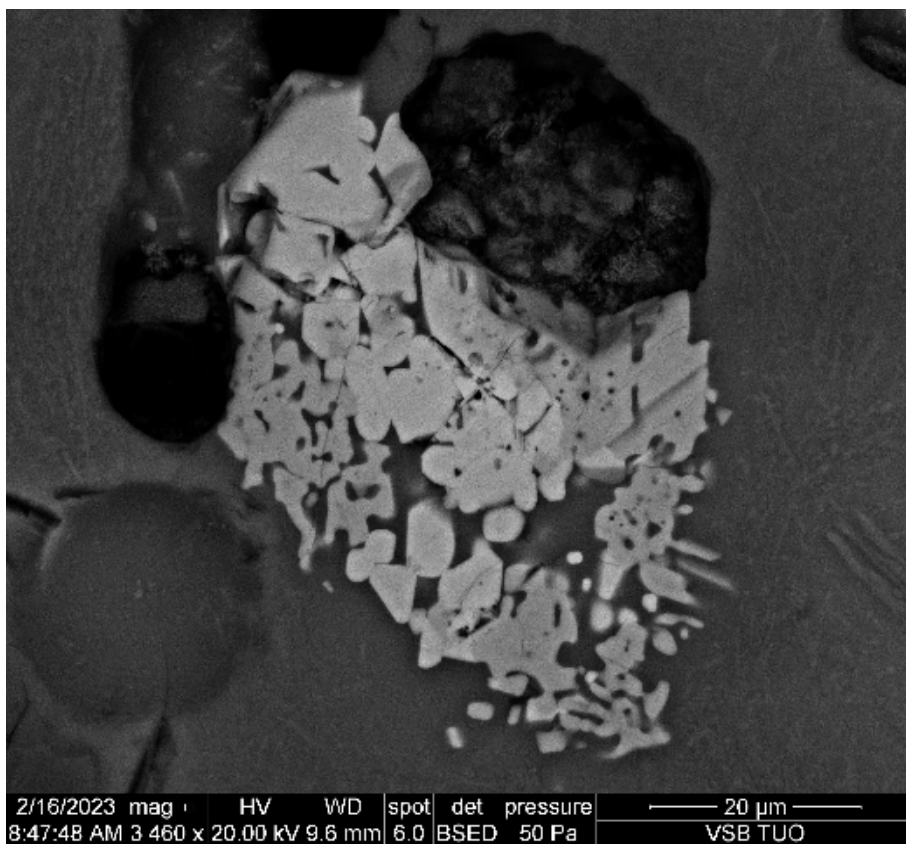


Krystaly SiO<sub>2</sub> ve skle a póry.

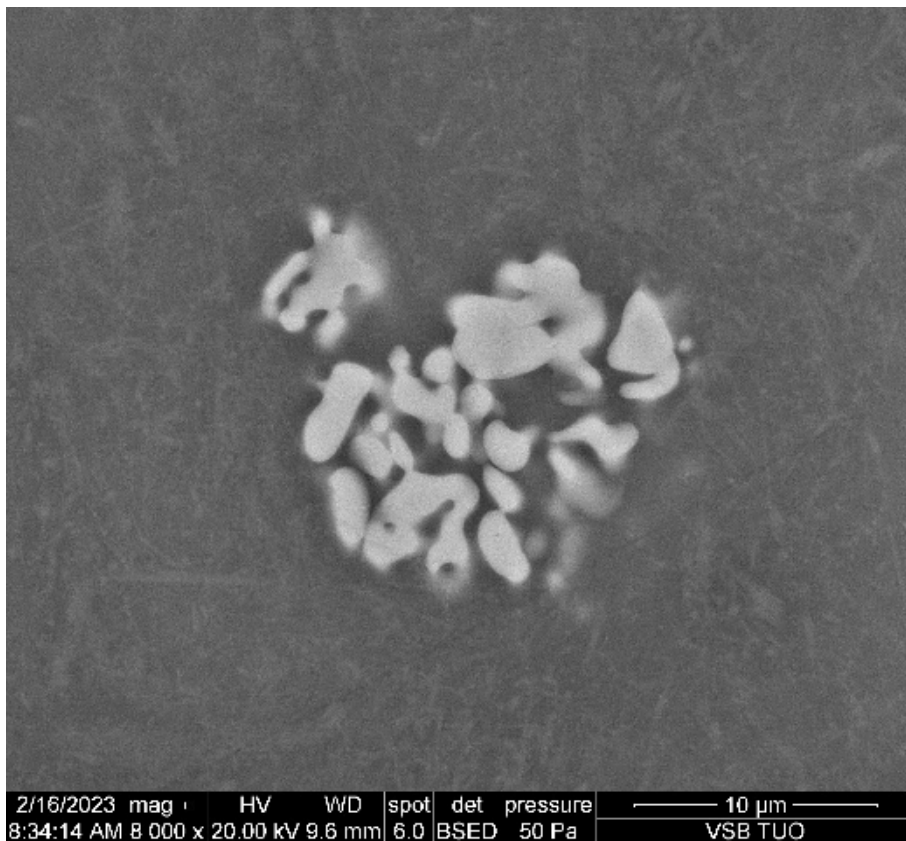


Krystaly SiO<sub>2</sub> ve skle a póry.

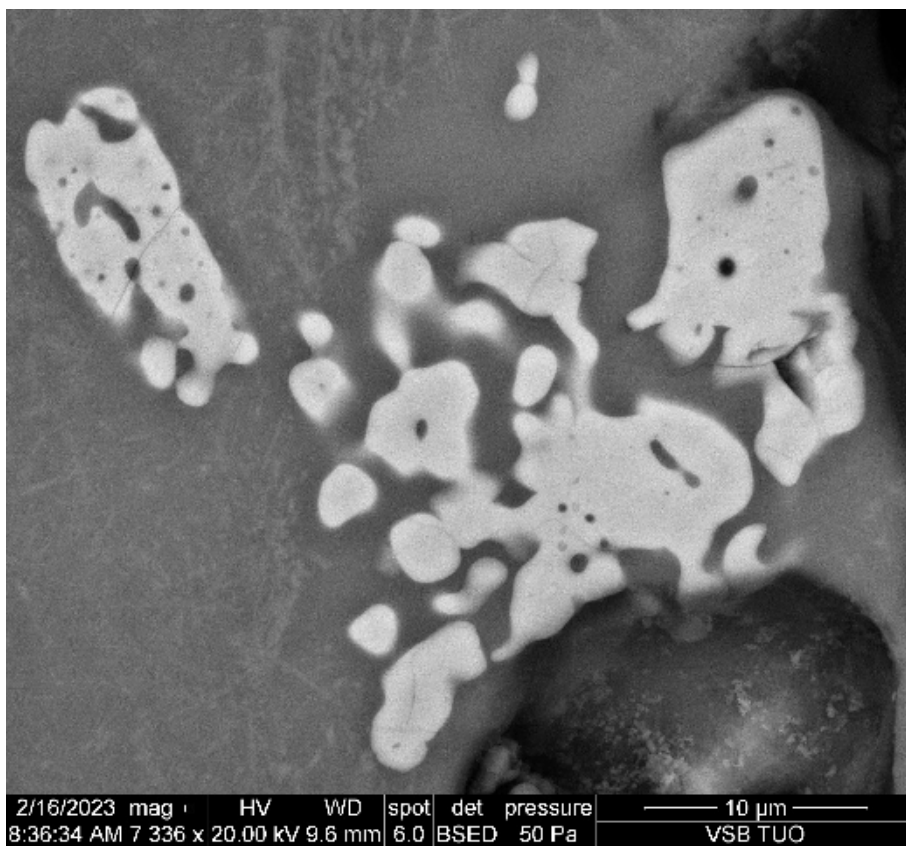
### Vzorek 2



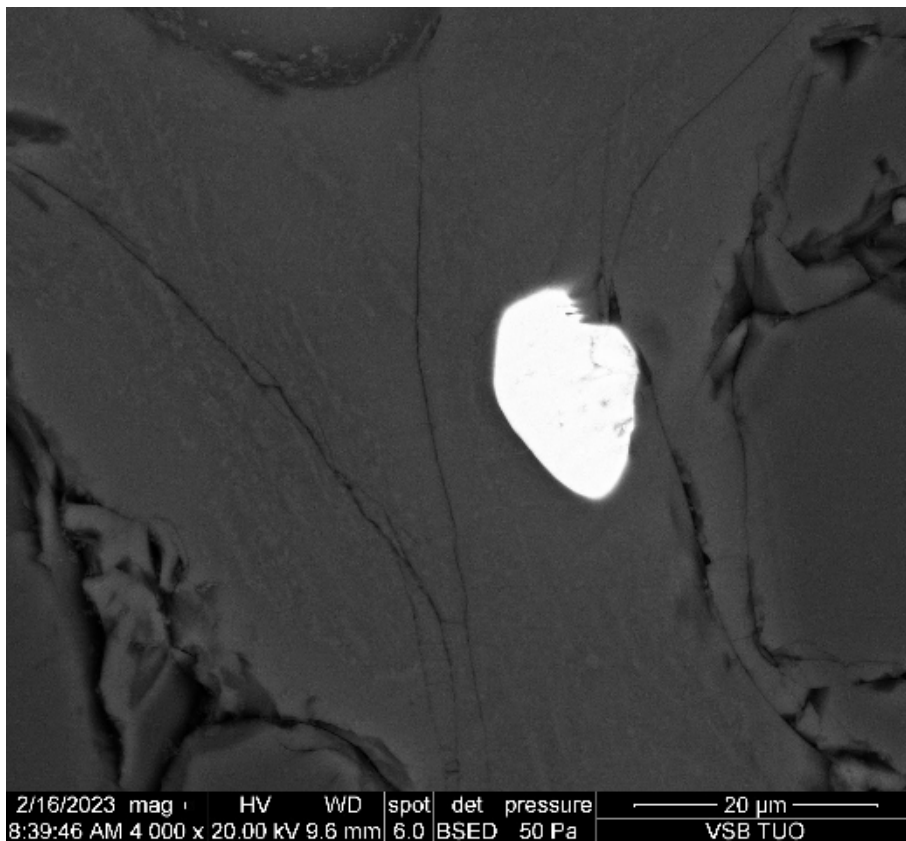
Aksesorie Al-Ti-ox a TiO<sub>2</sub>.



Aksesorie Al-Ti-ox.

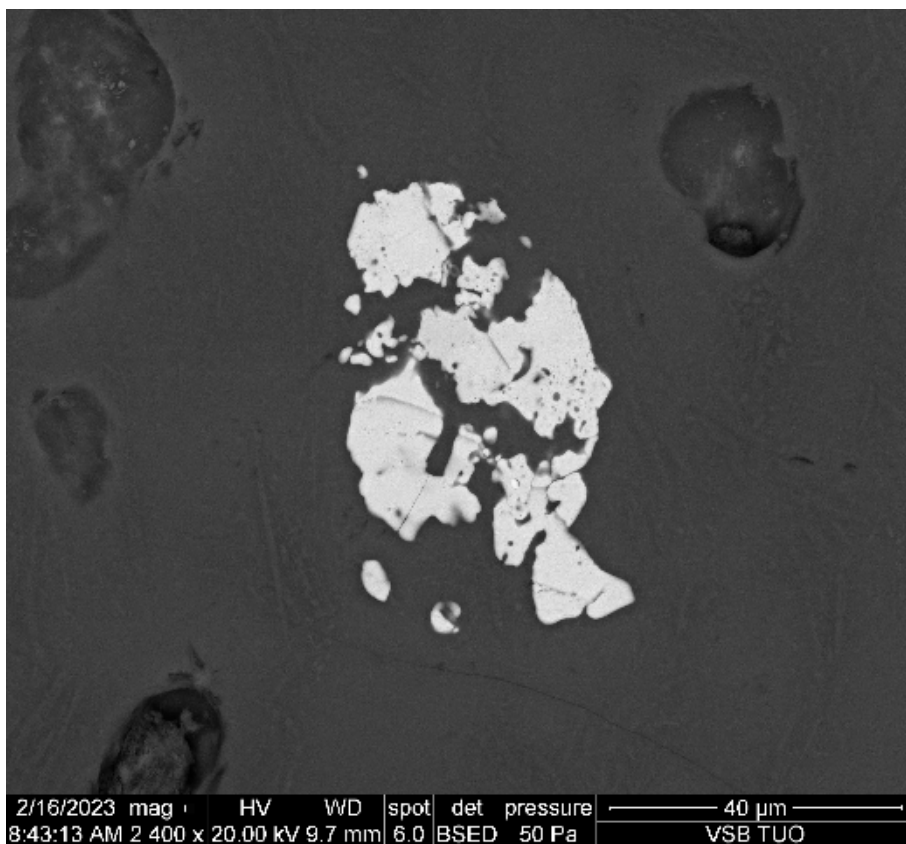


Aksesorie Al-Ti-ox.



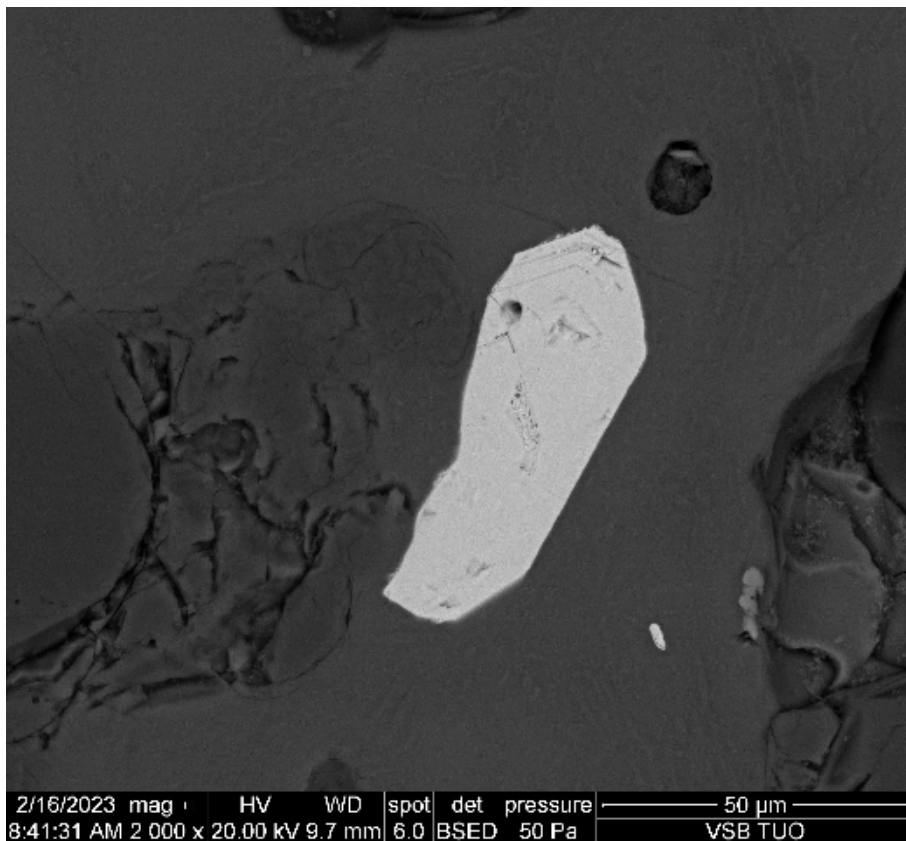
2/16/2023	mag	HV	WD	spot	det	pressure	20 $\mu$ m
8:39:46 AM	4 000 x	20.00 kV	9.6 mm	6.0	BSED	50 Pa	VSBU TUO

Akcesorický monazit.

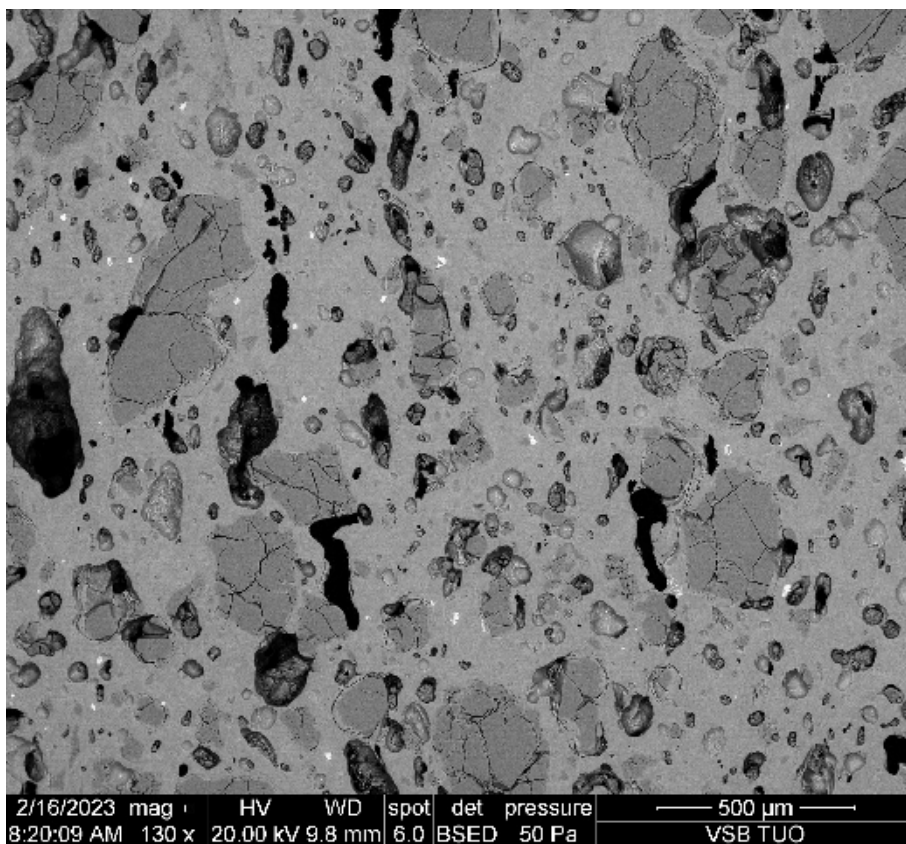


2/16/2023	mag	HV	WD	spot	det	pressure	40 $\mu$ m
8:43:13 AM	2 400 x	20.00 kV	9.7 mm	6.0	BSED	50 Pa	VSBU TUO

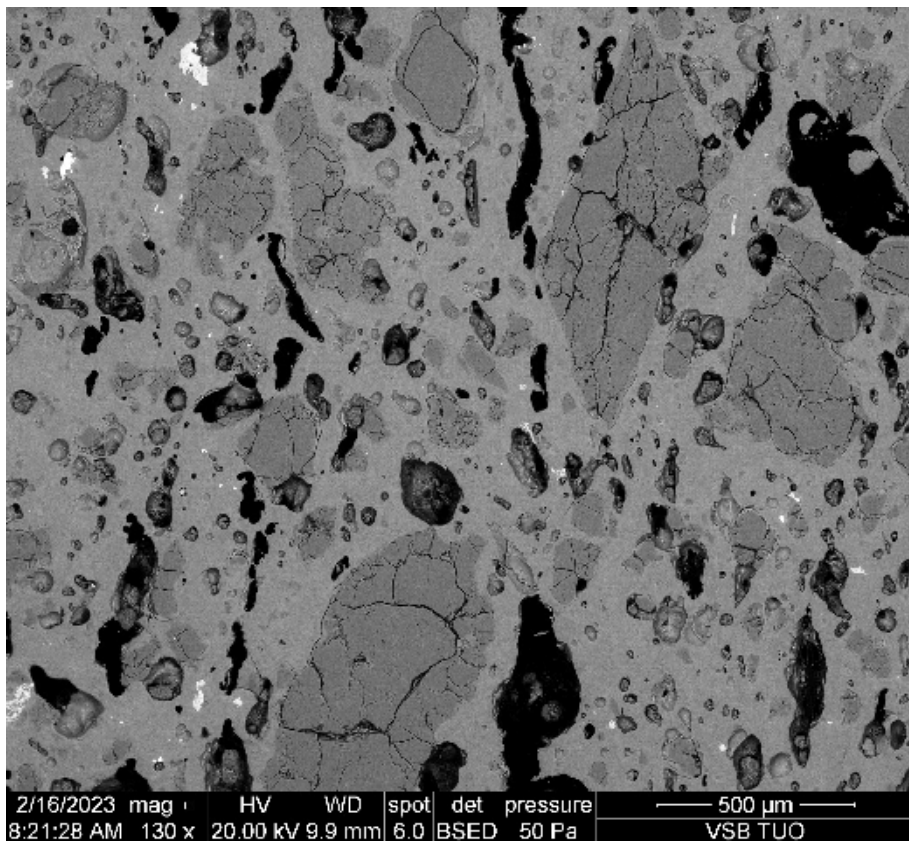
Akcesorický xenotim.



Akcesorický zirkon.



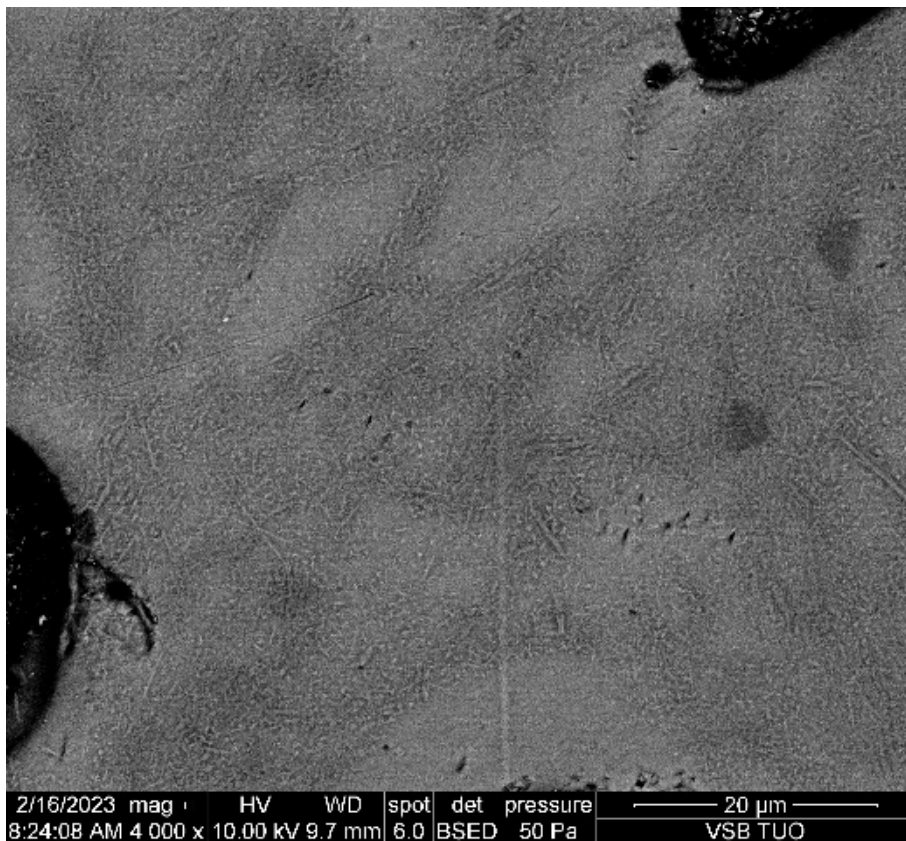
SiO<sub>2</sub> v mulitické hmotě, póry, akcesorie



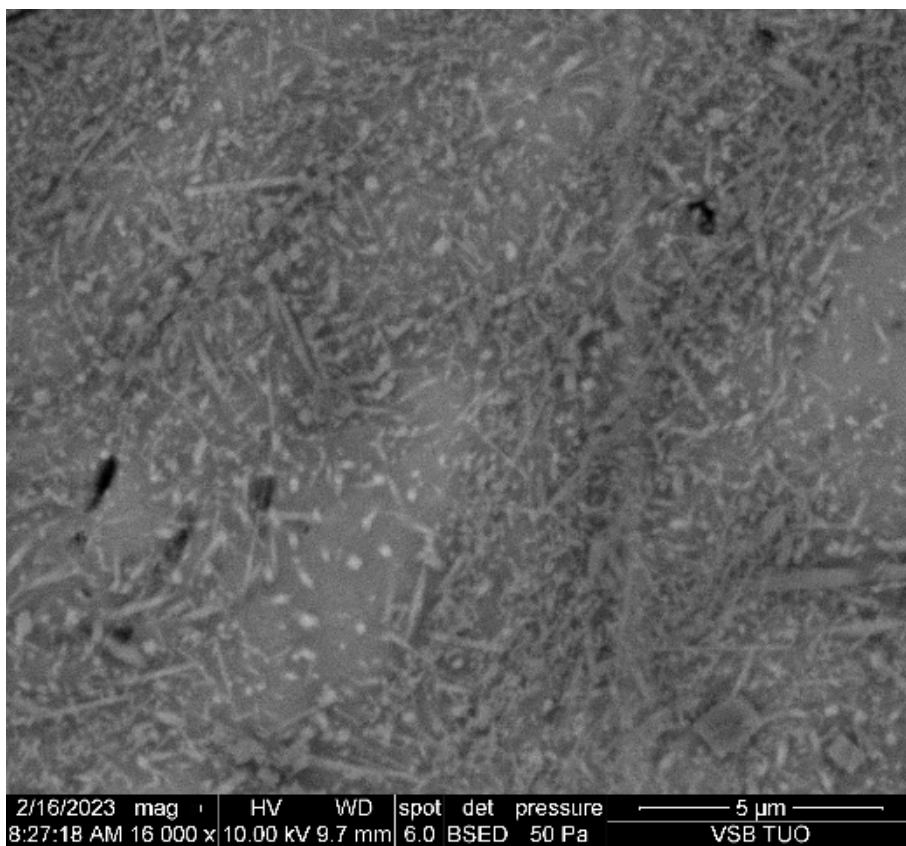
SiO<sub>2</sub> v multické hmotě, póry, akcesorie



SiO<sub>2</sub> v multické hmotě, póry, akcesorie



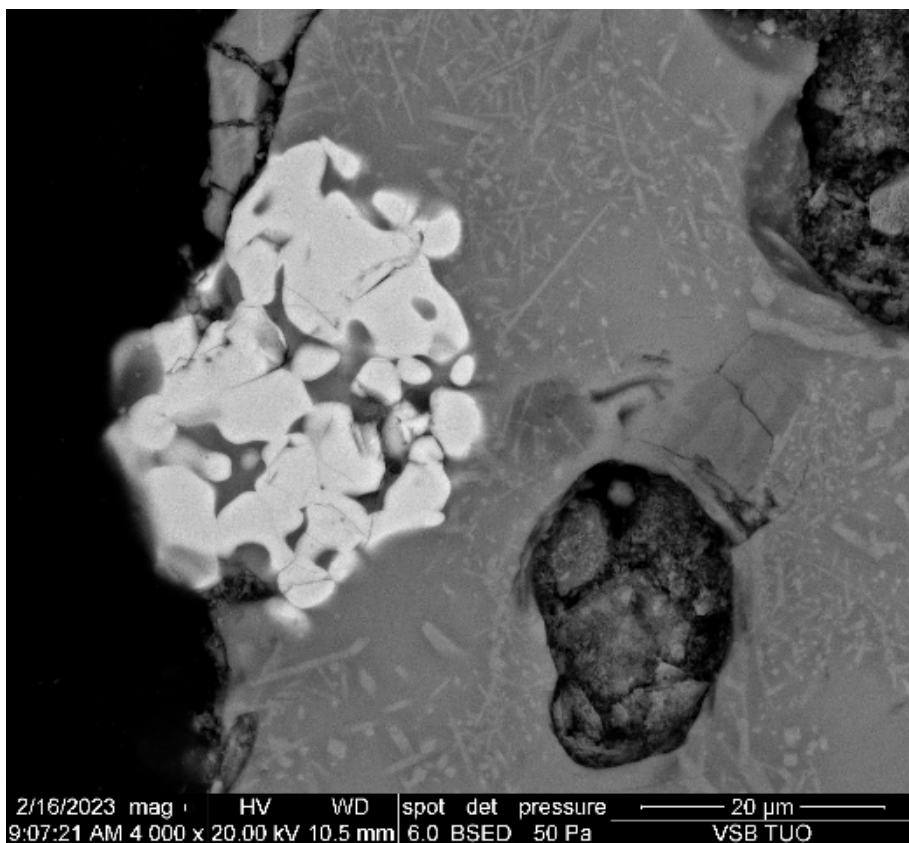
SiO<sub>2</sub> v multické hmotě, póry, akcesorie



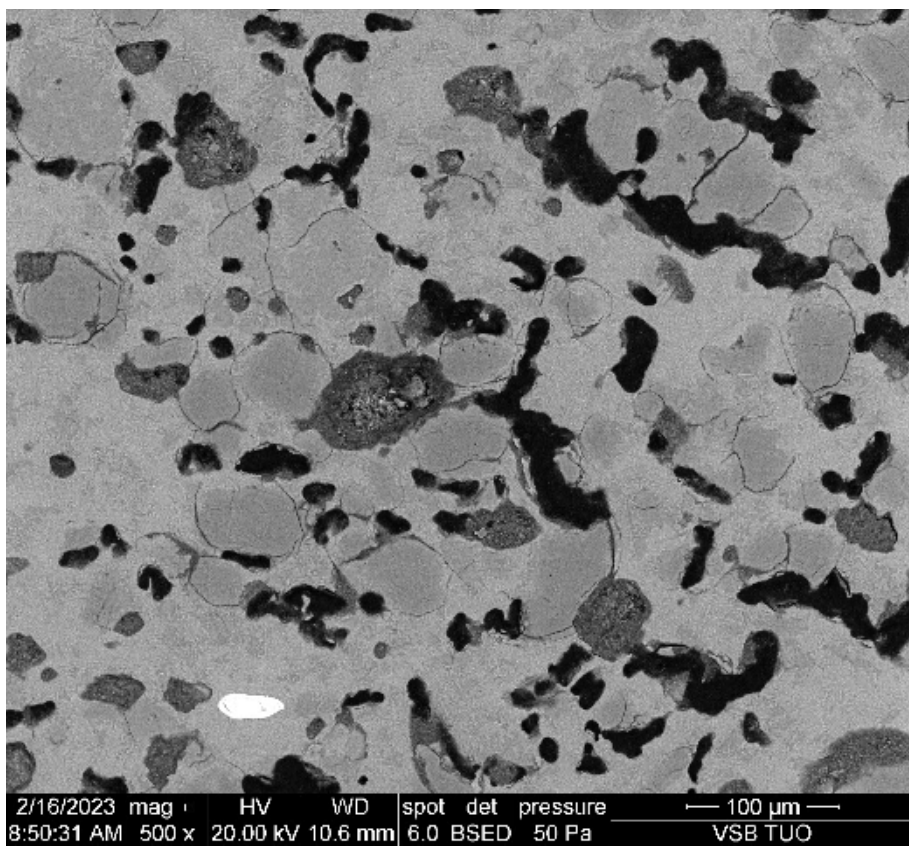
SiO<sub>2</sub> v multické hmotě, póry, akcesorie



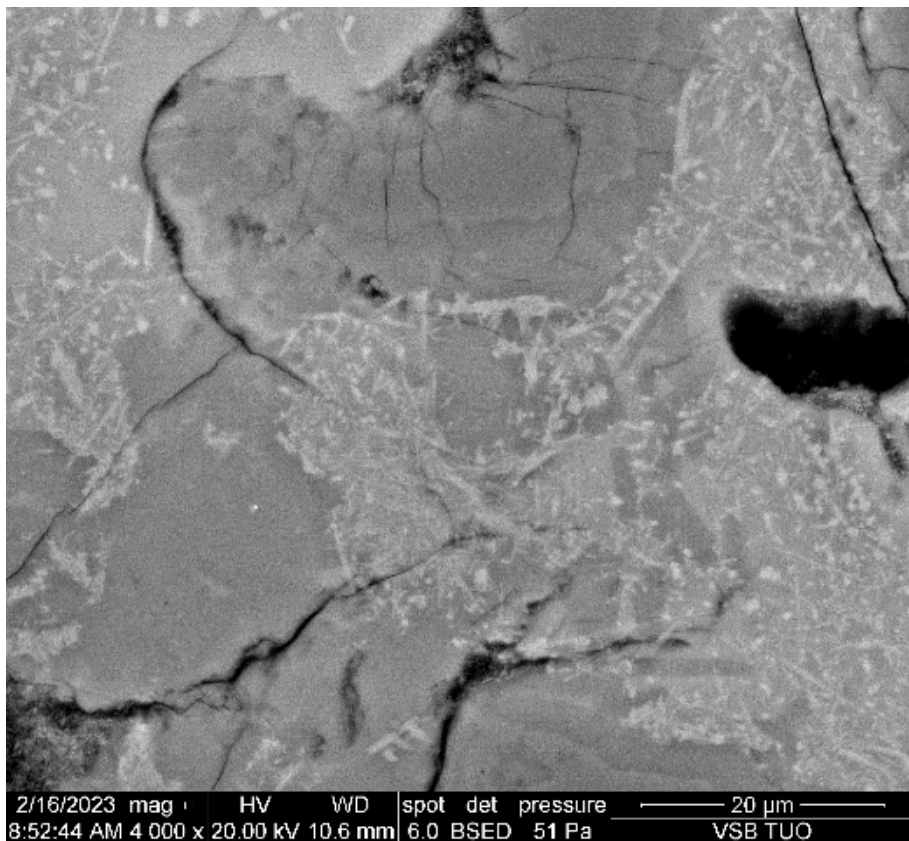
### Vzorek 3



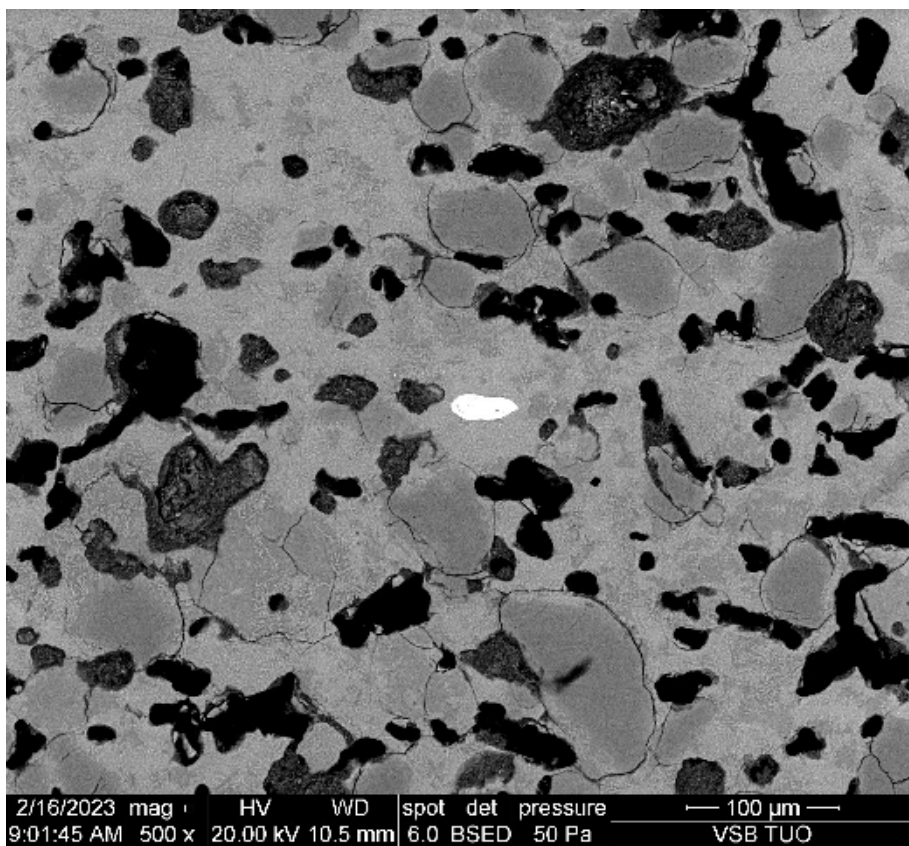
Akcesorie Al-Ti-ox, mullitická hmota, sklo.



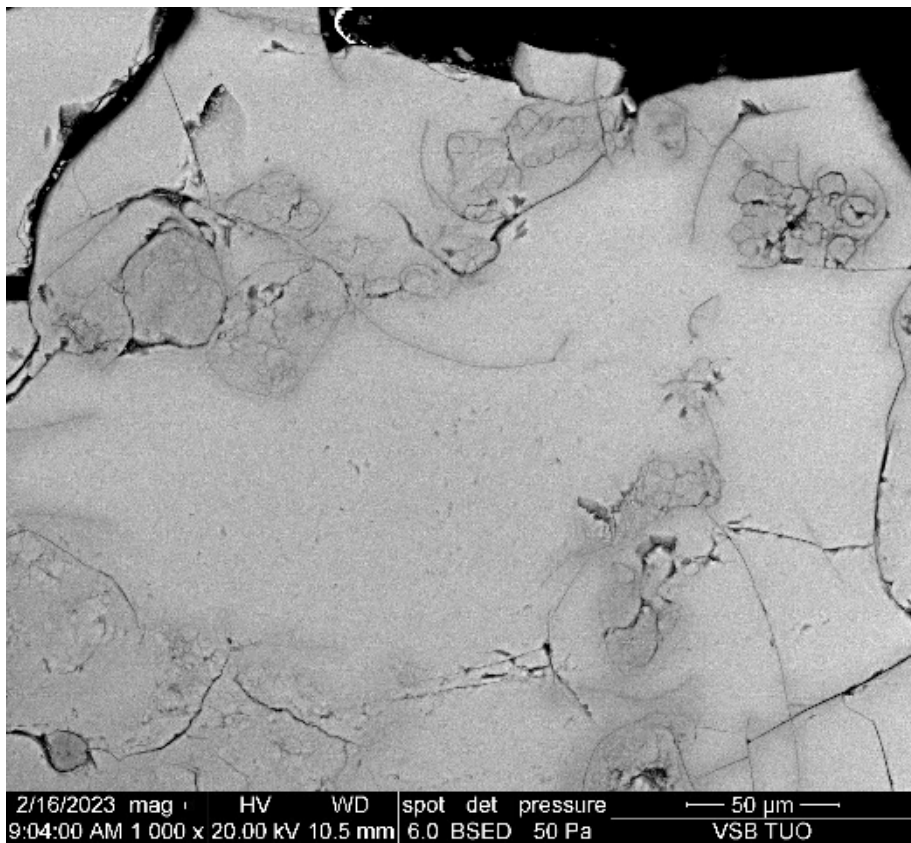
SiO<sub>2</sub> v mullitické hmotě a skle, akcesorie.



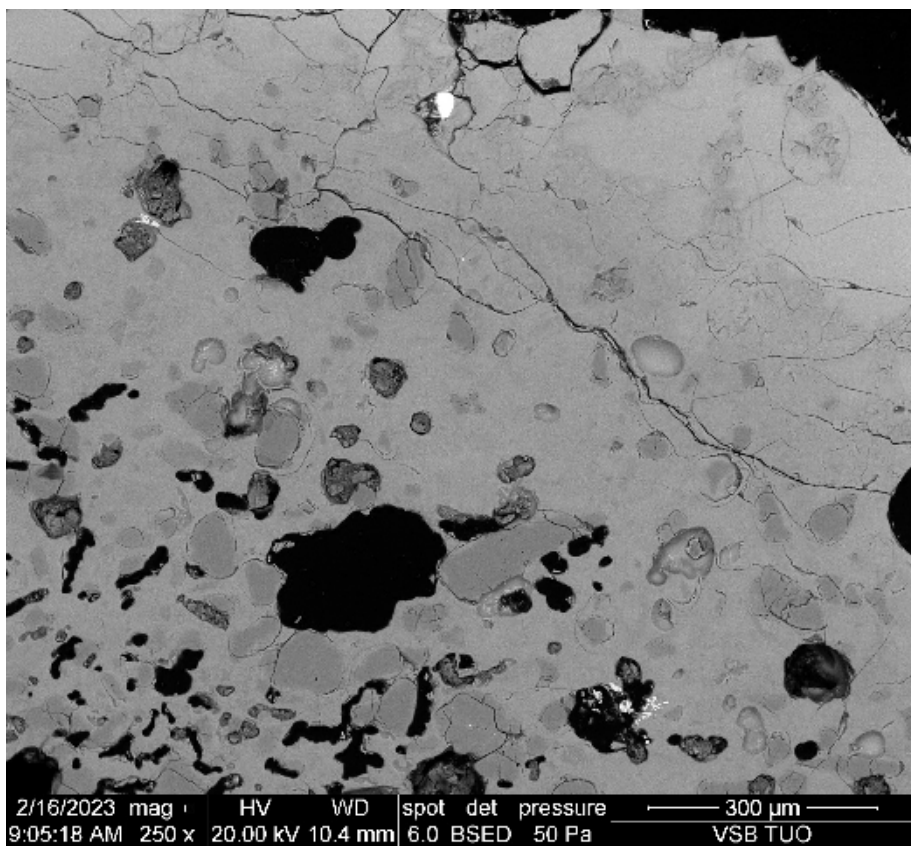
SiO<sub>2</sub> v mullitické hmotě a skle, akcesorie.



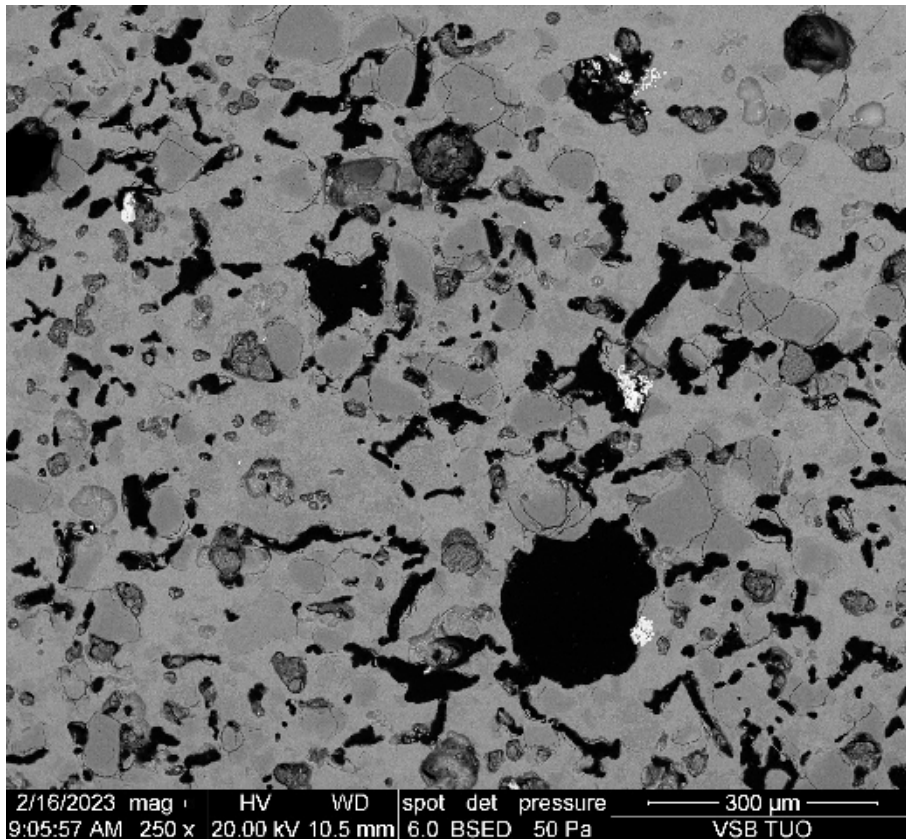
SiO<sub>2</sub> v mullitické hmotě a skle, akcesorie.



Sklovitý okraj vzorku

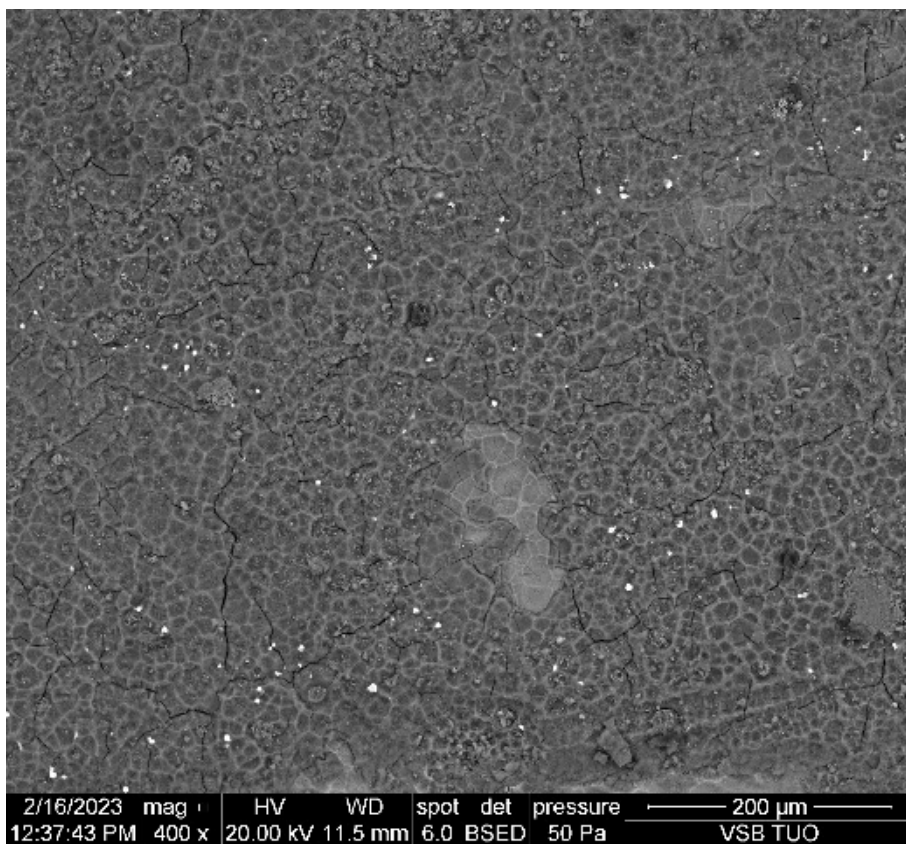


Sklovitý okraj vzorku

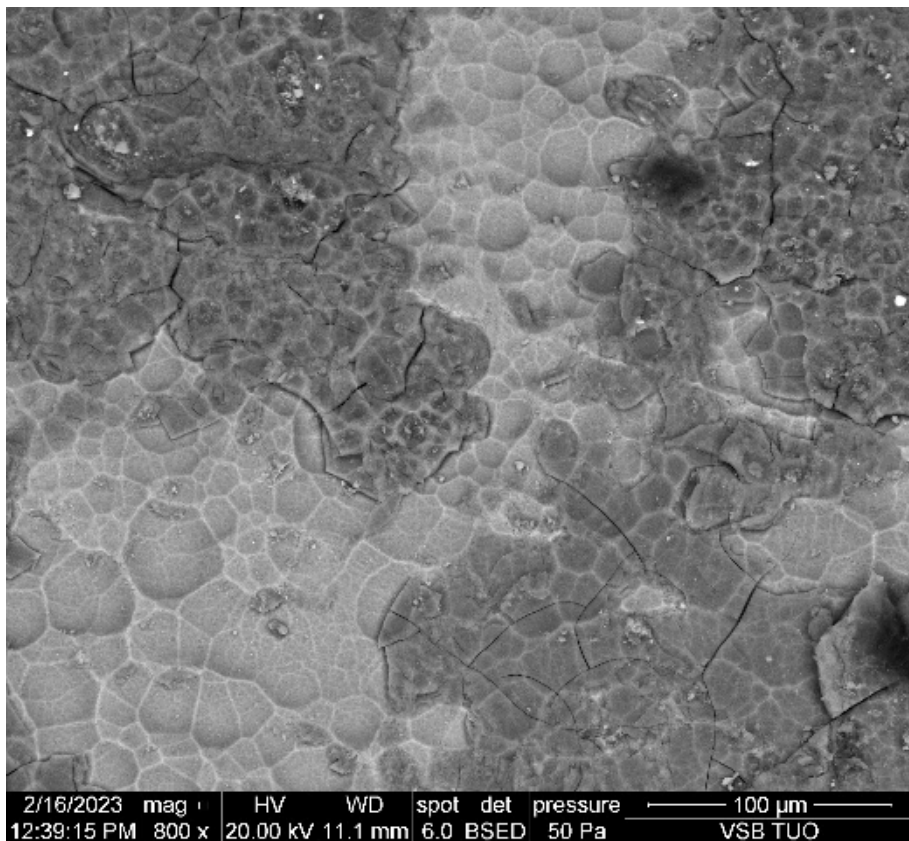


Okraj vzorku 3

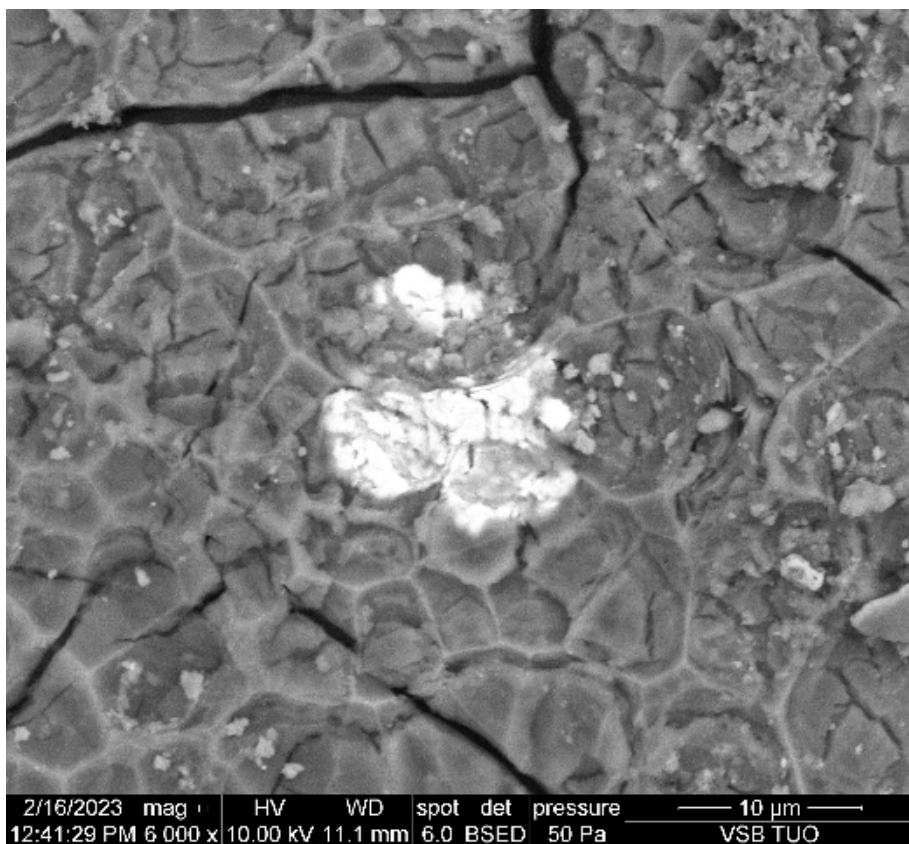
**Vzorek 8**



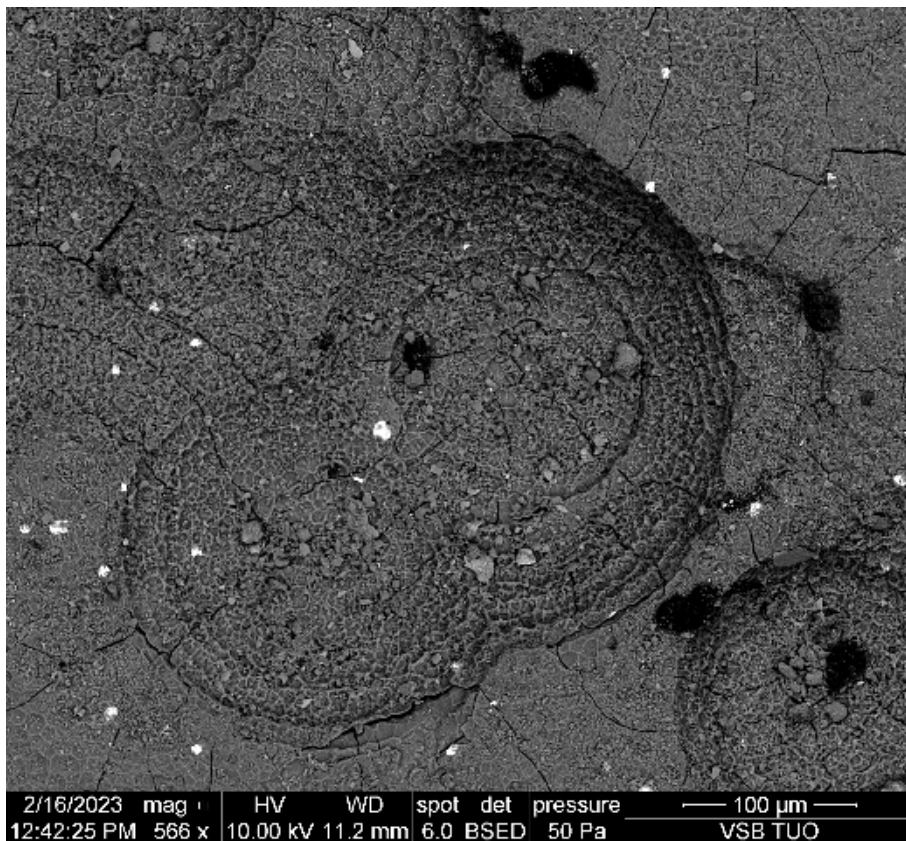
Povrch skla



Povrch skla

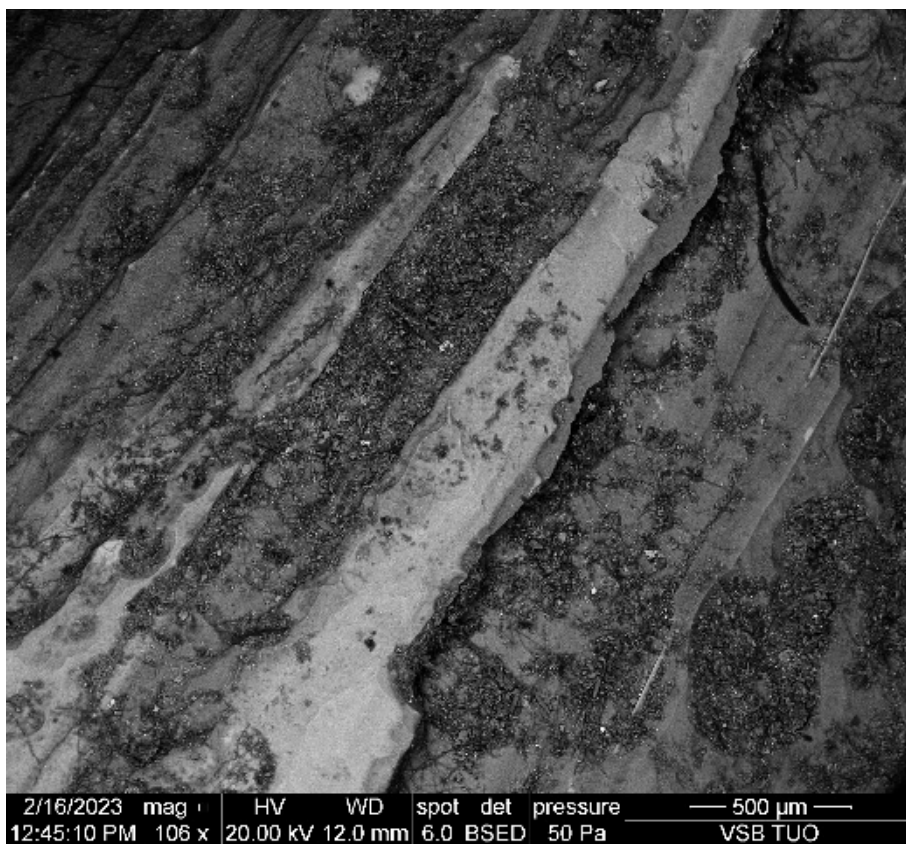


Povrch skla a baryt

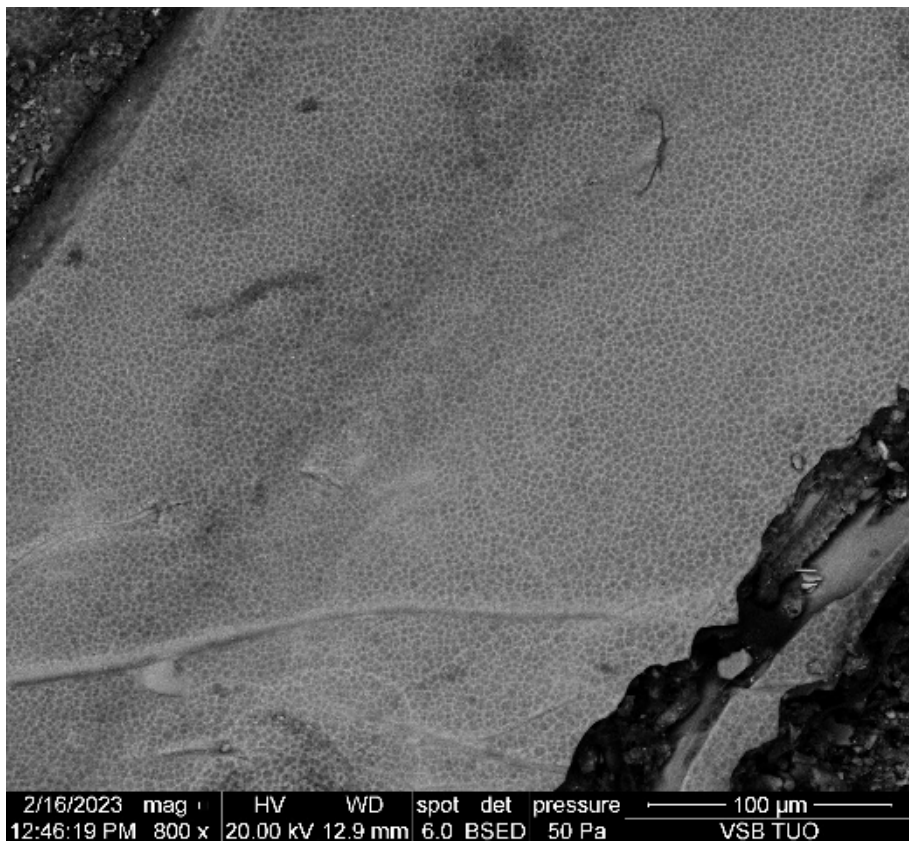


Povrch skla a baryt

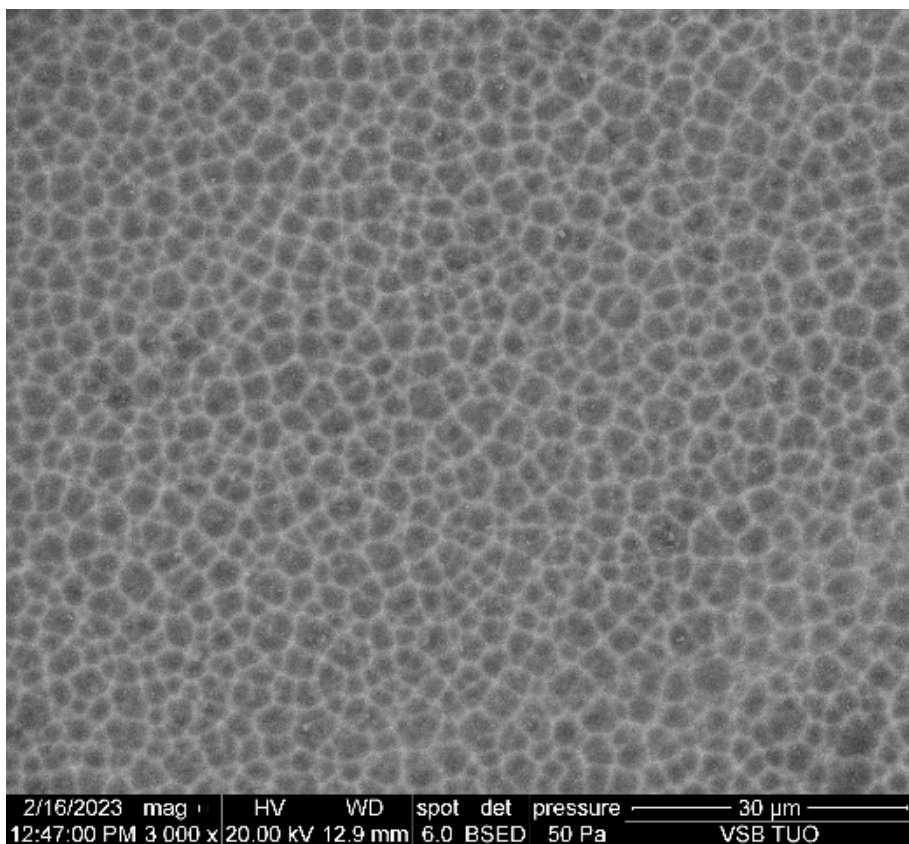
**Vzorek 9**



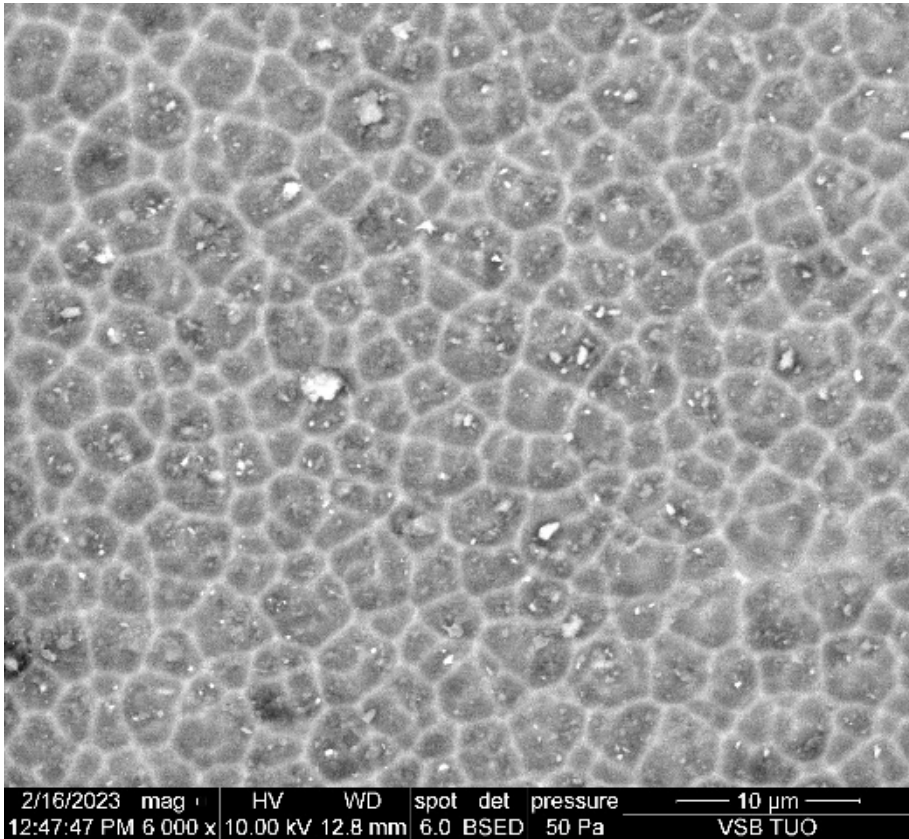
Povrch skla



Povrch skla

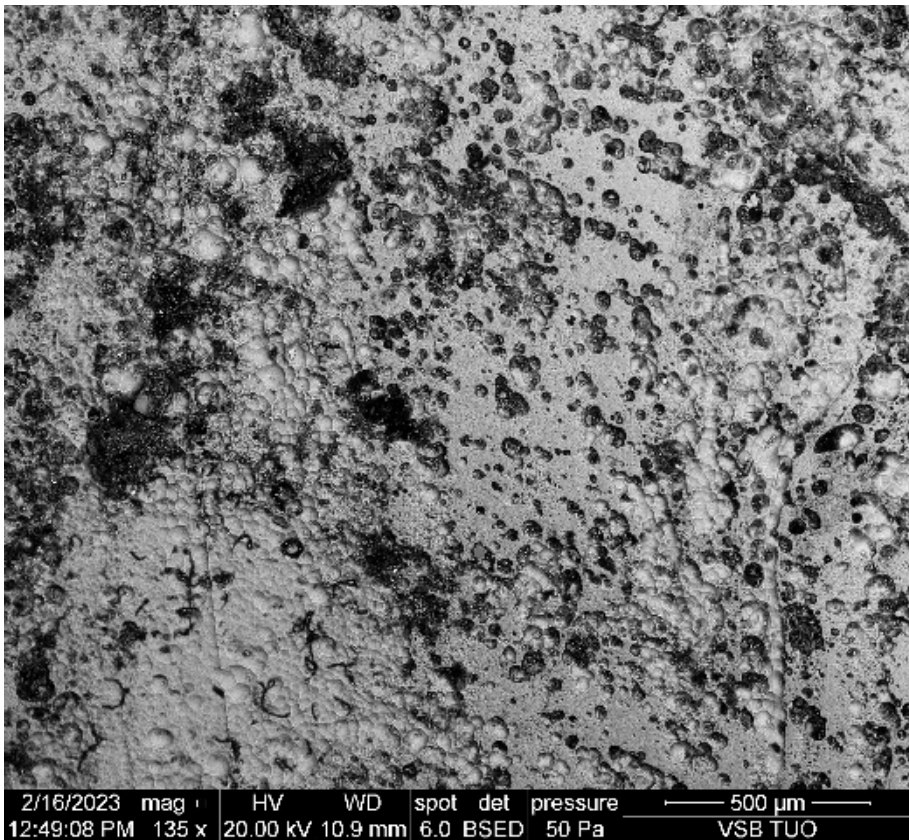


Povrch skla



2/16/2023 mag | HV WD spot det pressure | 10 µm |  
12:47:47 PM 6 000 x | 10.00 kV 12.8 mm | 6.0 BSED 50 Pa | VSB TUO

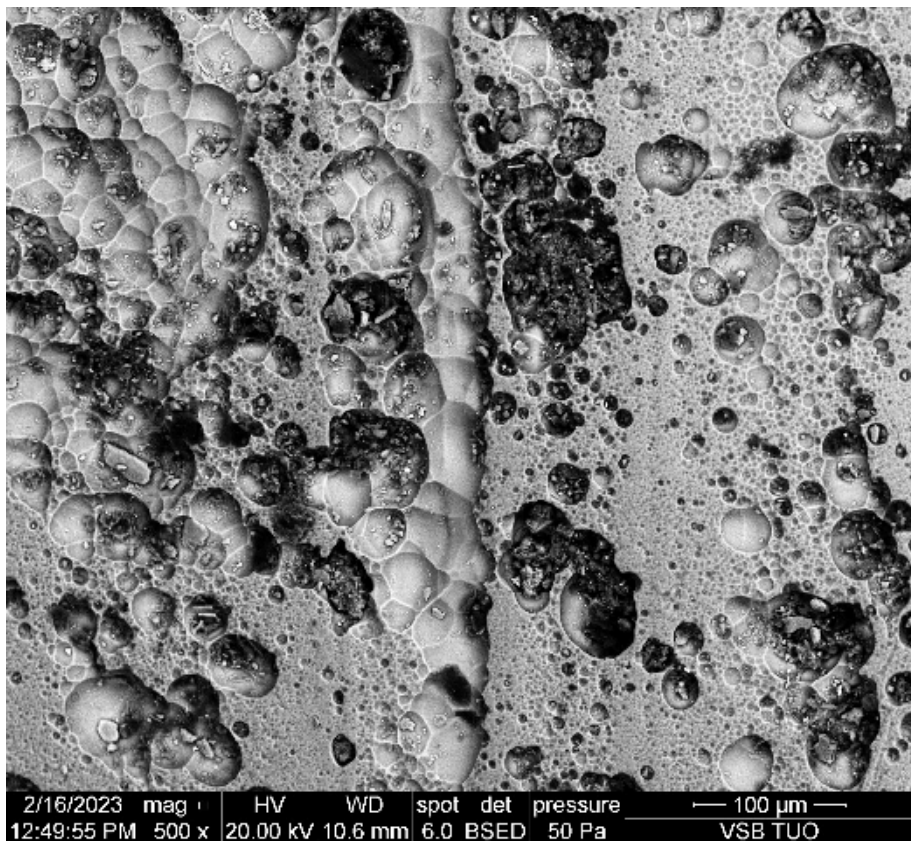
Povrch skla



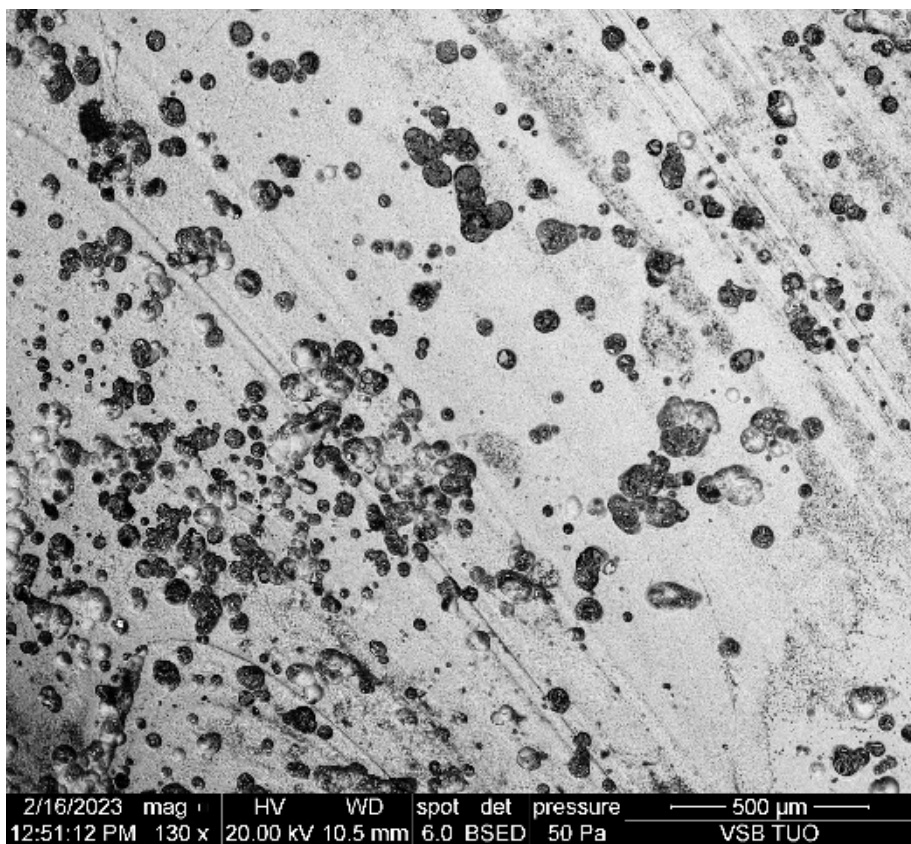
2/16/2023 mag | HV WD spot det pressure | 500 µm |  
12:49:08 PM 135 x | 20.00 kV 10.9 mm | 6.0 BSED 50 Pa | VSB TUO

Povrch skla

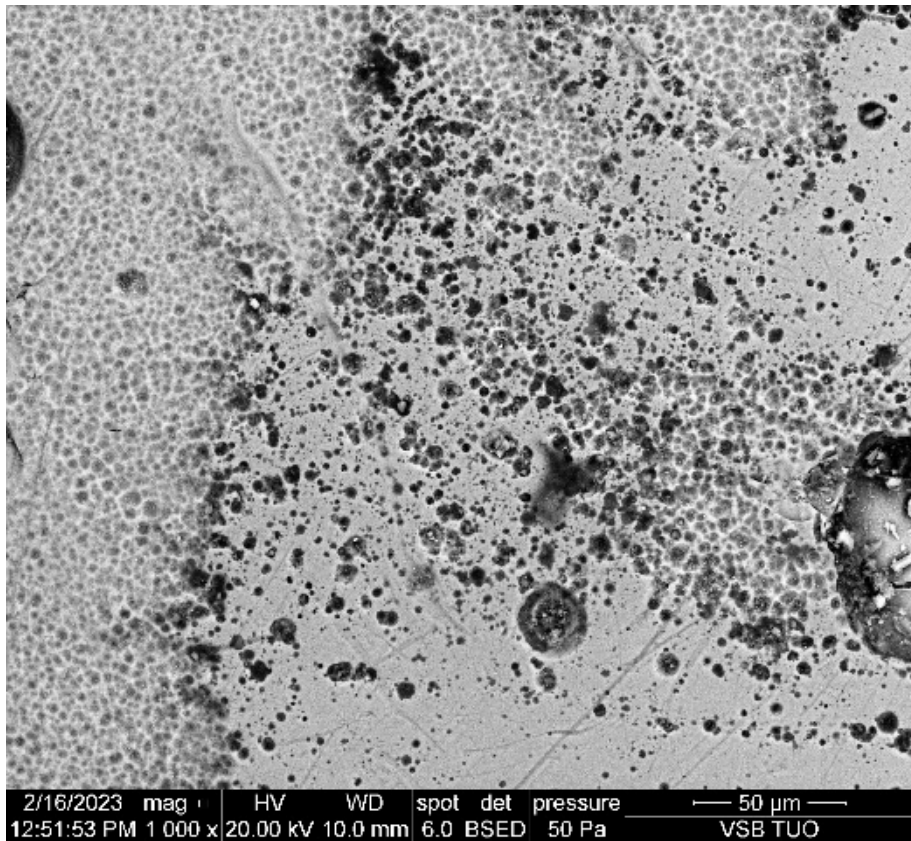




Povrch skla



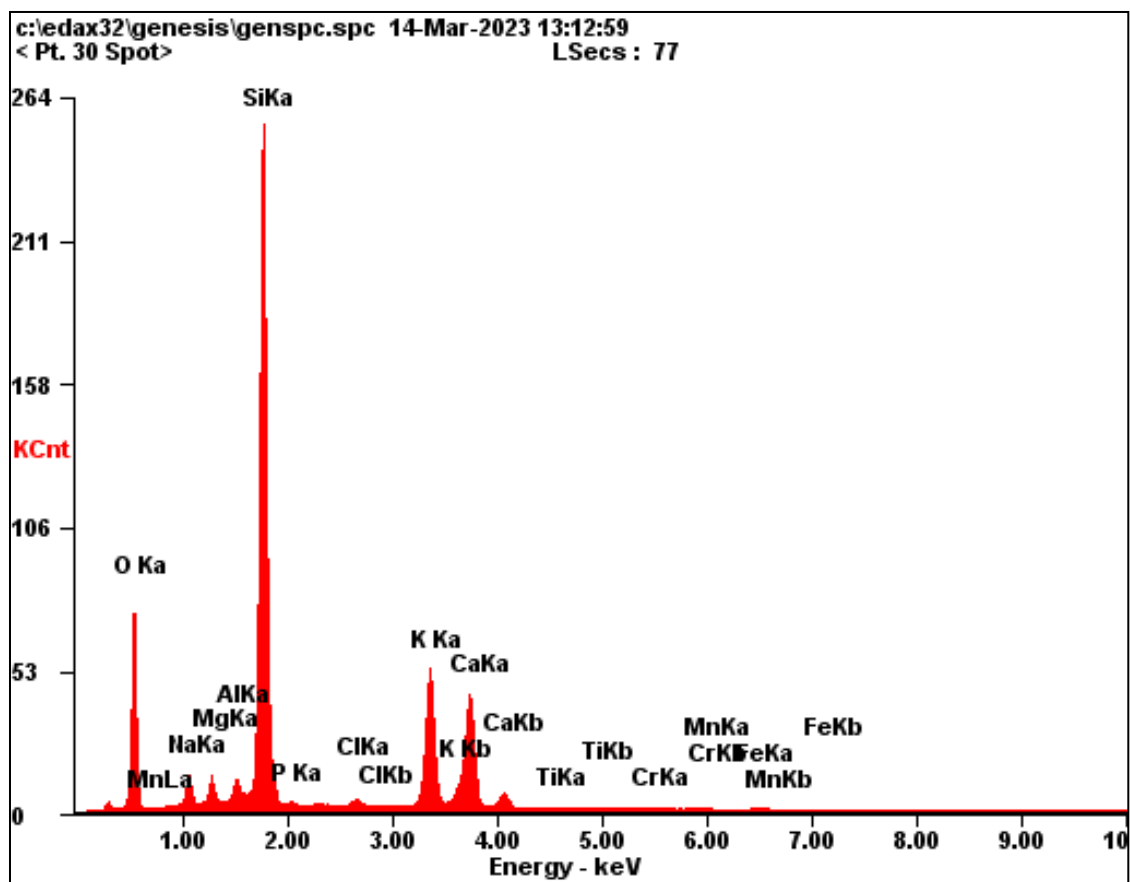
Povrch skla



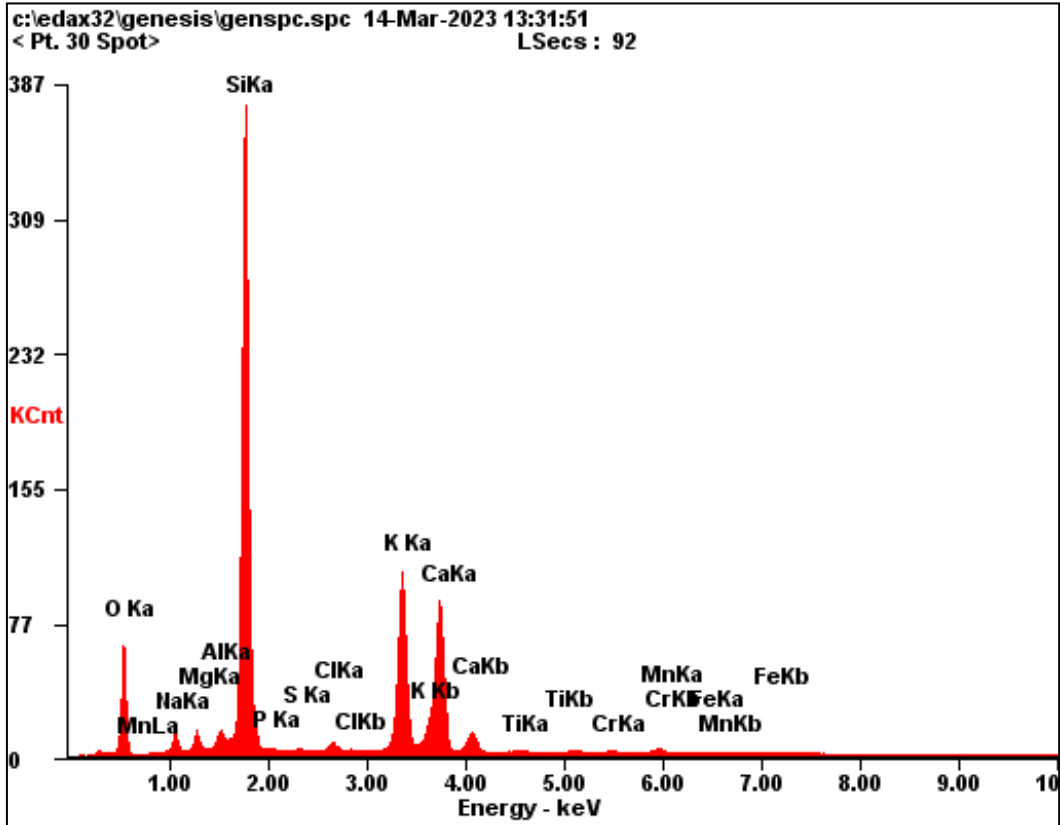
Povrch skla

## 4 EDAX - bodová analýza

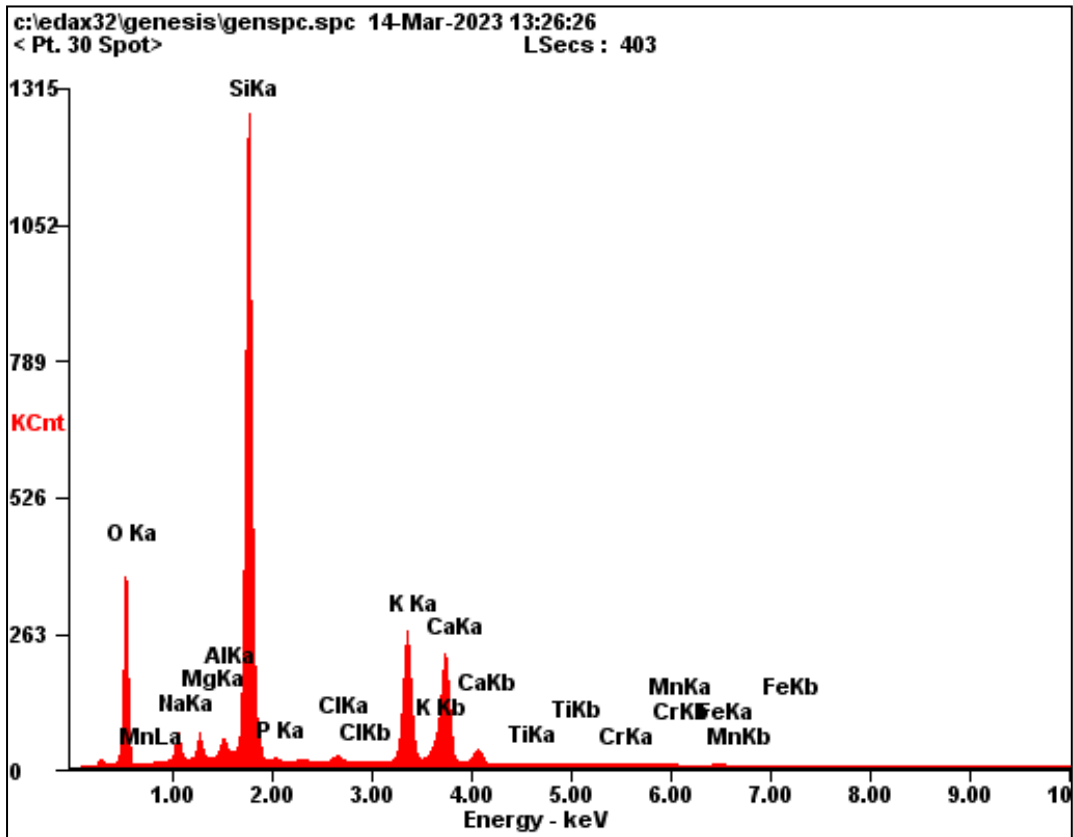
### Vzorek 8 - Kunčice p. O., sklo, úkap od píšťaly



Element	Wt %	Mol %
Na <sub>2</sub> O	02.63	02.66
MgO	02.34	03.65
Al <sub>2</sub> O <sub>3</sub>	02.10	01.29
SiO <sub>2</sub>	64.20	67.13
P <sub>2</sub> O <sub>5</sub>	00.47	00.21
Cl <sub>2</sub> O	00.55	00.40
K <sub>2</sub> O	13.32	08.89
CaO	13.35	14.96
TiO <sub>2</sub>	00.15	00.12
Cr <sub>2</sub> O <sub>3</sub>	00.20	00.08
MnO	00.50	00.44
FeO	00.19	00.16

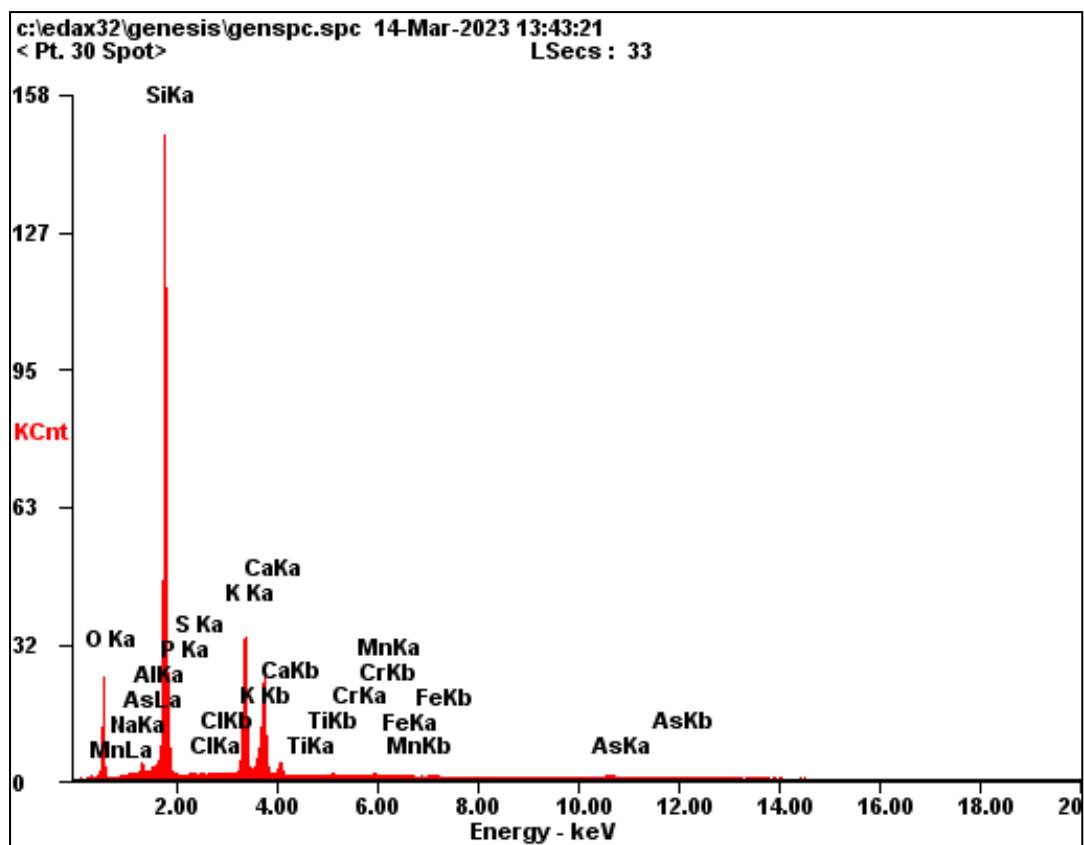


<i>Element</i>	<i>Wt %</i>	<i>Mol %</i>
<i>Na2O</i>	02.61	02.65
<i>MgO</i>	02.43	03.78
<i>Al2O3</i>	02.04	01.25
<i>SiO2</i>	64.12	66.99
<i>P2O5</i>	00.49	00.22
<i>Cl2O</i>	00.56	00.40
<i>K2O</i>	13.28	08.85
<i>CaO</i>	13.45	15.06
<i>TiO2</i>	00.16	00.12
<i>Cr2O3</i>	00.18	00.07
<i>MnO</i>	00.51	00.45
<i>FeO</i>	00.19	00.17

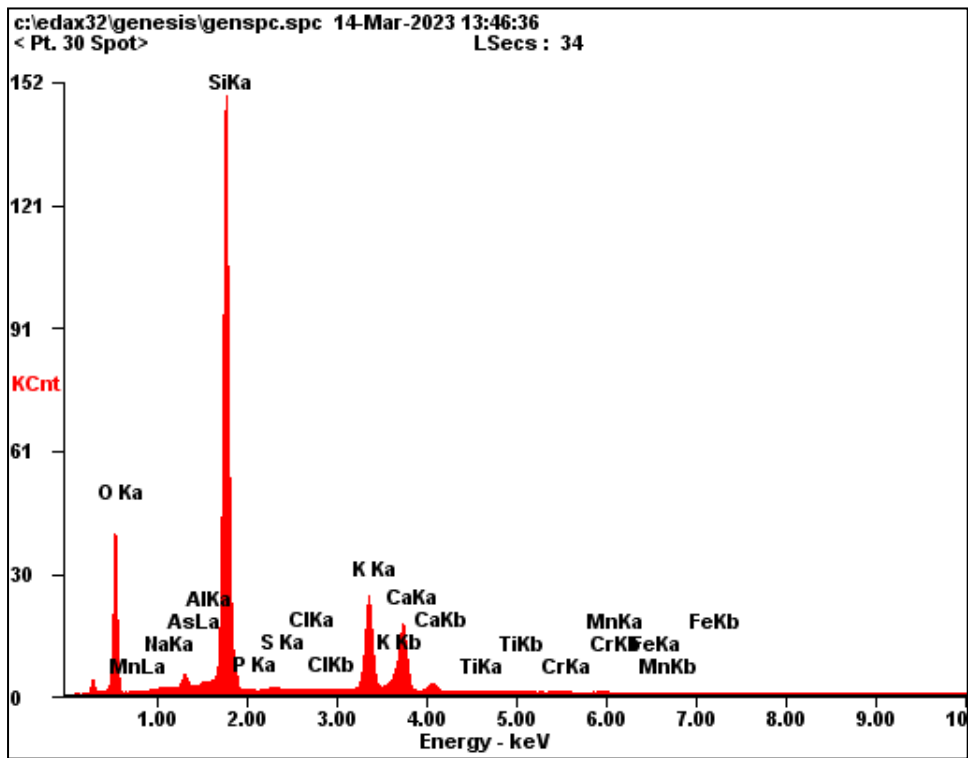


<i>Element</i>	<i>Wt %</i>	<i>Mol %</i>
<i>Na2O</i>	02.34	02.38
<i>MgO</i>	02.29	03.58
<i>Al2O3</i>	02.09	01.29
<i>SiO2</i>	63.62	66.68
<i>P2O5</i>	00.50	00.22
<i>SO3</i>	00.25	00.20
<i>Cl2O</i>	00.59	00.43
<i>K2O</i>	13.45	08.99
<i>CaO</i>	13.57	15.24
<i>TiO2</i>	00.23	00.18
<i>Cr2O3</i>	00.26	00.11
<i>MnO</i>	00.54	00.48
<i>FeO</i>	00.24	00.21

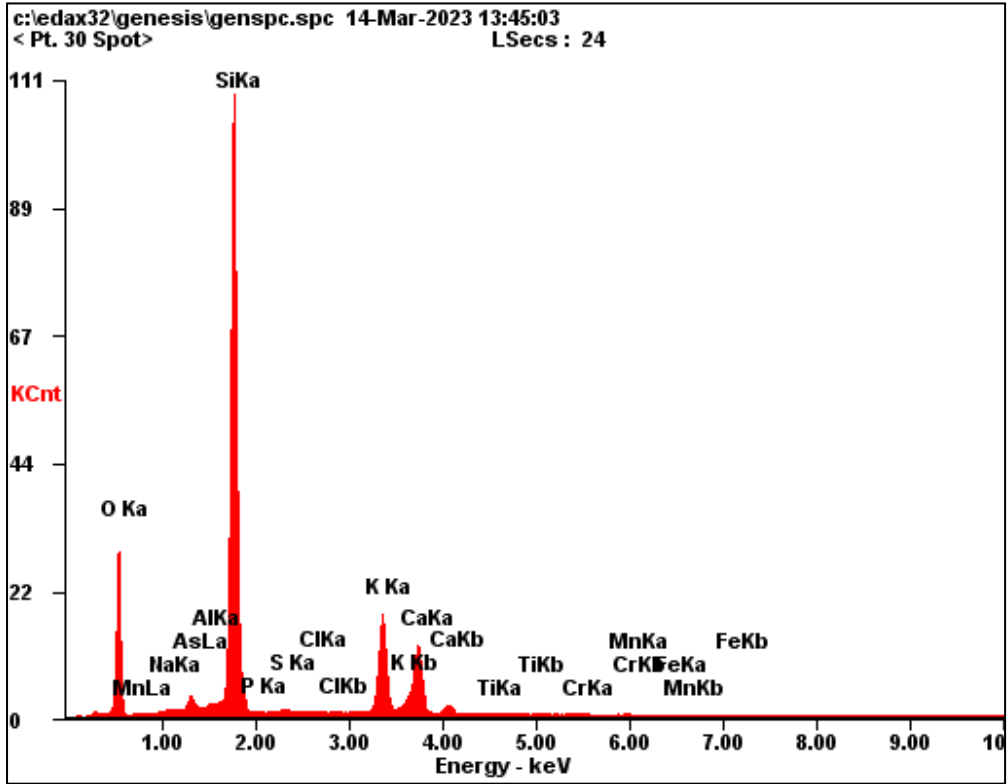
**Vzorek – Bystré, okenní terčík**



<i>Element</i>	<i>Wt %</i>	<i>Mol %</i>
<i>Na2O</i>	00.14	00.14
<i>Al2O3</i>	00.41	00.26
<i>SiO2</i>	71.62	76.15
<i>P2O5</i>	00.00	00.00
<i>SO3</i>	00.53	00.42
<i>Cl2O</i>	00.16	00.12
<i>K2O</i>	13.11	08.89
<i>CaO</i>	10.99	12.52
<i>TiO2</i>	00.14	00.11
<i>Cr2O3</i>	00.29	00.12
<i>MnO</i>	00.50	00.45
<i>FeO</i>	00.24	00.21
<i>As2O3</i>	01.87	00.60



<i>Element</i>	<i>Wt %</i>	<i>Mol %</i>
<i>Na2O</i>	00.17	00.17
<i>Al2O3</i>	00.52	00.32
<i>SiO2</i>	72.83	77.32
<i>P2O5</i>	00.00	00.00
<i>SO3</i>	00.58	00.46
<i>Cl2O</i>	00.13	00.09
<i>K2O</i>	12.54	08.49
<i>CaO</i>	10.58	12.04
<i>TiO2</i>	00.04	00.03
<i>Cr2O3</i>	00.28	00.12
<i>MnO</i>	00.20	00.18
<i>FeO</i>	00.15	00.13
<i>As2O3</i>	01.99	00.64



<i>Element</i>	<i>Wt %</i>	<i>Mol %</i>
<i>Na2O</i>	00.20	00.20
<i>Al2O3</i>	00.56	00.35
<i>SiO2</i>	72.48	76.99
<i>P2O5</i>	00.00	00.00
<i>SO3</i>	00.63	00.50
<i>Cl2O</i>	00.14	00.10
<i>K2O</i>	12.56	08.51
<i>CaO</i>	10.63	12.10
<i>TiO2</i>	00.08	00.07
<i>Cr2O3</i>	00.27	00.11
<i>MnO</i>	00.30	00.27
<i>FeO</i>	00.18	00.16
<i>As2O3</i>	01.96	00.63