Message ID: **186** Entry time: **Tue Sep 26 09:19:11 2023**

Experiment Date:	2023 09 26
Duration (Days):	5
User:	Anja Miokovic, Stjepko Fazinic, Iva Bozicevic Mihalic
Accelerator:	Tandetron
Beam Line:	Old uProbe
Project:	Hi-REXS (HRZZ projekt)
Experiment Title:	HR PIXE Ka Na compounds
Beam:	2 MeV H
Method:	HR PIXE

Beam deflection was connected to the horizontal deflector with -700 V.

GreatControl: X Binning = OFF, Y Binning = OFF, Readout Speed = 500 kHz, Gain = Max Sensitivity, Correct Bias = UNCHECKED, T_{ccd}= -70 ºC, T_{back}= 23 ºC, Chiller at 18 ºC

Chamber positioned according to the black marks on the floor that were drawn in February.

Surface barrier detector was tested in the test chamber, feedthrough was broken and changed. Now it works so the RBS detector was mounted in the chamber.

25.9.2023.

Beam: 2 MeV H^+ TDT

Focus: Me 16.3 A, Ox 35.2 A

Diffraction crystal: Beryl(1010) at 10.5 cm, peeking out of holder 3 mm, with blue dot facing the main door

I~2.2 nA on the metal before the measurement

Samples: Na_2SO3+Zn (position 1), Na_2SO_3 (position 2), NaCl (position 3), NIST 620 glass (position 4)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2309169	NaCl	1	30	NaKa line visible in Vista at ch~160
2309170	NaCl	1	30	NaKa line visible in Vista at ch~540, we are satisfied with that position of crystal
2309171	Na_2SO_3	1	7	I~1.8 nA
2309172	Dark	10	7	
2309173	Na_2SO_3	400	7	unstable beam (I varying between 1 and 2.8 nA)
2309174	Na_2SO_3	400	7	- || -, switching magnet value needs to be changed constantly
2309175	Na_2SO_3	400	7	
2309176	Na_2SO_3	387	7	beam was lost

Warning: Pointer that shows crystal position has been bent so it shows lower value on scale than what is real. Pointer should be corrected with the next opening of the chamber.

26.9.2023.

Beam: 2 MeV H^+ TDT

Diffraction crystal: Beryl(1010) at 10.5 cm, peeking out of holder 3 mm, with blue dot facing the main door

Samples: Na_2SO3+Zn (position 1), Na_2SO_3 (position 2), NaCl (position 3), NIST 620 glass (position 4)

PIXE: Coarse gain=1 k; Fine gain=3; Shaping time=2 us

RBS: Bias=+35 V; Coarse gain=200; Fine gain=2, shaping time 0.5 us

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2309177	NIST 620 glass	1	60	
2309178	DARK	10	10	
2309179	NIST 620 glass	300	10	
2309180	NIST 620 glass	300	10	
2309181	NIST 620 glass	300	10	
2309182	NIST 620 glass	300	10	Spector file 2309082 (wrong name!) started at frame~212 -> collecting PIXE+RBS spectra
2309183	NIST 620 glass	300	10	I~3 nA, more or less stable; collecting Spector file 2309083 (wrong name!) with PIXE and RBS spectra
2309184	NIST 620 glass	300	10	collecting Spector file with the same name with PIXE and RBS spectra
2309185	NIST 620 glass	300	10	- || -
2309186	NIST 620 glass	300	10	Spector file 2309185 contains previous set of frames, this set and 1/3 of next set
2309187	NIST 620 glass	/	/	C peak appears in RBS spectra so the sample was moved by 10 mm and only RBS and PIXE spectra were collected for 10 minutes

27.9.2023.

Beam: 2 MeV H^+ TDT

Focus: Me 17.5 A, Ox 35.0 A

Diffraction crystal: Beryl(1010) at 10.5 cm, peeking out of holder 3 mm, with blue dot facing the main door

Samples: Na_2SO3+Zn (position 1), Na_2SO_3 (position 2), NaCl (position 3), NIST 620 glass (position 4)

PIXE: Coarse gain=1 k; Fine gain=3; Shaping time=2 us

RBS: Bias=+50 V; Coarse gain=200; Fine gain=2, shaping time 0.5 us

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2309188	Na_2SO_3+Zn	1	30	I~3 nA
2309189	DARK	10	10	
2309190	Na_2SO_3+Zn	270	10	I~3 nA; ZnLb not visible in spectrum from Matlab analysis -> moving to new position
2309191	Na_2SO_3+Zn	300	10	I~3 nA, new position, ZnLa slightly higher than NaKa in spectrum from Matlab analysis ->we are satisfied
2309192	Na_2SO_3+Zn	300	10	I~3 nA; collecting Spector file with the same name (PIXE + RBS spectra)
2309193	Na_2SO_3+Zn	300	10	- || -
2309194	Na_2SO_3+Zn	300	10	- || -
2309195	Na_2SO_3+Zn	300	10	- || -
2309196	Na_2SO_3+Zn	300	10	- || -

28.9.2023.

Beam: 2 MeV H^+ TDT

Focus: Me 17.4 A, Ox 35.2 A

Diffraction crystal: Beryl(1010) at 10.5 cm, peeking out of holder 3 mm, with blue dot facing the main door

Samples: NIST 620 glass powder + Zn in pellet (position 2), NaCl (position 3), NIST 620 glass (position 4)

PIXE: Coarse gain=1 k; Fine gain=3; Shaping time=2 us

RBS: Bias=+50 V; Coarse gain=200; Fine gain=2, shaping time 0.5 us

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2309197	NIST 620 + Zn	1	10	
2309198	DARK	10	10	
2309199	NIST 620 + Zn, different positions	33?	10	I~1.5 nA; 1st position (frames 0-16): I(SiK)/I(ZnK)≈6.3/1 in SDD spectrum -> Zn too high in HR spectrum; 2nd position (frames 17-33): I(SiK)/I(ZnK)≈33/1 in SDD spectrum -> Zn too low in HR spectrum; beam lost at frame~33
2309200	NIST 620 + Zn, different positions	300	10	I~3.2 nA but falling; after changing positions seven times (details in logbook) we stayed at one decided at frame~250: I(SiK)/I(ZnK)≈12.5/1 in SDD spectrum
Changes have been made in HigResMotion.ini file: -> A4_S1=100 (it was 1000) -> we concluded this is speed both for motors and sample holder -> A1_S1=50 (it was 100) -> this shouldn't affect our setup but at first we thought this is the correction we should do				
2309201	NIST 620 + Zn	300	10	I~3.6 nA, collecting Spector file with the same name (PIXE + RBS spectra)
2309202	NIST 620 + Zn	200	10	beam lost, meaasurement stopped
2309203	NIST 620 + Zn	300	10	Spector file 2309203 corresponds to two sets of measurement: 203+204
2309204	NIST 620 + Zn	64	10	beam lost, meaasurement stopped
2309205	NIST 620 + Zn	300	10	I~4.2 nA; collecting Spector file with the same name (PIXE + RBS spectra)
2309206	NIST 620 + Zn	300	10	I~4 nA; collecting Spector file with the same name (PIXE + RBS spectra)
2309207	NIST 620 + Zn	300	10	I~3.8 nA; collecting Spector file with the same name (PIXE + RBS spectra)

29.9.2023.

Beam: 2 MeV H^+ TDT

Focus: Me 17.4 A, Ox 35.2 A

Diffraction crystal: Beryl(1010) at 10.5 cm, peeking out of holder 3 mm, with blue dot facing the main door

Samples: $Na(_2O)$? inside Zn holder (position 3)

PIXE: Coarse gain=1 k; Fine gain=3; Shaping time=2 us

RBS: Bias=+50 V; Coarse gain=200; Fine gain=2, shaping time 0.5 us

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2309208	$Na(_2O)$?+Zn	1	10	
2309209	DARK	10	10	
2309210	$Na(_2O)$?+Zn	300	10	collecting Spector file with the same name (PIXE + RBS spectra), but it was restarted by accident at frame~280; from Matlab analysis -> it definitely looks more like oxide than pure Na
2309211	Zn	/	/	Spector file only!
2309212	Na_2O but only on surface?	/	/	- || -
2309213	Na_2O but only on surface?, new position	235	10	I~5 nA at the beginning -> reduced to I~3.5 nA; collecting Spector file with the same name (PIXE + RBS spectra) -> but it was not stopped before removing bias from RBS (in post-analysis replay it without last part!); stopped at frame 235
2309214	Zn holder	1	10	I~3.8 nA, from Vista it looks like there are too many events -> reducing exposure time
2309215	DARK	10	5	
2309216	Zn holder, 1st position	335	5	I~4 nA; collecting Spector file with the same name (PIXE + RBS spectra); in HR spectrum we also see small Na peak -> we want pure Zn so we move to new position

2309217	Zn holder, 2nd position	50	5	I~3.6 nA; collecting Spector file with the same name (PIXE + RBS spectra) but we forgot to stop it on time; again small Na peak in HR spectrum -> we move to new position
2309218	Zn holder, 3rd position	100	5	I~3.2-3.8 nA; collecting Spector file with the same name (PIXE + RBS spectra); again small Na peak in HR spectrum ->it seems that there is no way to get rid off it, we will stay here
2309219	Zn holder, 3rd position	600	5	I~4-3 nA; collecting Spector file with the same name (PIXE + RBS spectra)