Message ID: **200** Entry time: **Wed Mar 6 13:16:37 2024**

Experiment Date:	2024 03 06
Duration (Days):	3
User:	Anja Miokovic, Stjepko Fazinic, Iva Bozicevic Mihalic
Accelerator:	Tandetron
Beam Line:	Old uProbe
Project:	Hi-REXS (HRZZ projekt)
Experiment Title:	HR PIXE Mg compounds: measurements that needed to be repeated and new target
Beam:	2MeV H, 3 MeV He
Method:	HR PIXE, PIXE, RBS

Chamber positioned according to the black marks on the floor.

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

PIXE: Coarse gain=1 k; Fine gain=3; Shaping time=2 us; covered with Al (1 mm thick) mask with hole of 2r=1.7 mm

RBS: Bias=+50 V; Coarse gain=200; Fine gain=7.08; Shaping time=1 us; covered with teflon mask (3 mm thick) with hole of 2r=3 mm

6.3.2024.

Beam: 2 MeV H^+ TDT

Scanning: x=10.0, y=9.55

Diffraction crystal: Beryl(1010) on 11.4 cm, peeking out of holder for 4 mm

Samples: $MgWO_4$+Ge (2), Mg+Ge (3), MgO+Ge (4), quartz (5), Cu mesh 400 (6)

Ge in mixtures is from Ge detector.

I~3.2 nA on metal before measurement

FILE	SAMPLE	DETECTOR	t_{exp}/s	N_{frames}	COMMENT
2403001	Cu mesh 400	SDD	/	/	SS=5x0.1
2403002	MgO+Ge	CCD	3	1	
2403003	DARK	CCD	3	10	
2403004	MgO+Ge	CCD, SDD	3	20	PIXE: I(GeKa)/I(GeLa+MgKa)~0.19, in HR-PIXE spectrum Ge is too high
2403005	MgO+Ge	CCD, SDD, SBD	3	1080	I~2.5 nA; PIXE: I(GeKa)/I(GeLa+MgKa)~0.12 -> good position
2403006	MgO+Ge	CCD, SDD, SBD	3	557	I~2 nA and very unstable
2403007	Cu mesh 400	SDD	/	/	SS=5x0.1
2403008	Mg+Ge	CCD	3	20	PIXE: I(GeKa)/I(GeLa+MgKa)~0.15 -> in HR-PIXE spectrum we want a little bit higher Ge
2403009	Mg+Ge	CCD	3	20	PIXE: I(GeKa)/I(GeLa+MgKa)~0.17 -> good position
2403010	DARK	CCD	5	10	
2403011	Mg+Ge	CCD, SDD, SBD	5	1030	I~1.5-4 nA -> very unstable, but then beam was optimized and got more stable: I~2.5 nA; with no apparent reason terminal voltage switched off by itself in the middle of the measurement and we had no beam until some specific power supply near TDT was turned on (Željko's instructions on call) -> frames 410-592 have no events; **carefully with the analysis: frames with max current should probably be excluded!**

Energy window used in Matlab analysis: [240, 360]

7.3.2024.

Beam: 2 MeV H^+ TDT

Focus: Me 16.5 A; Ox 34.8 A

Scanning: x=10.0, y=9.55

Diffraction crystal: Beryl(1010) on 11.4 cm, peeking out of holder for 4 mm

Samples: $MgWO_4$+Ge (2), Mg+Ge (3), MgO+Ge (4), quartz (5), Cu mesh 400 (6)

Ge in mixtures is from Ge detector.

FILE	SAMPLE	DETECTOR	t_{exp}/s	N_{frames}	COMMENT
2403012	Cu mesh 400	SDD	/	/	SS=5x0.1
2403013	$MgWO_4$+Ge	CCD	8	1	I~1.5 nA
2403014	DARK	CCD	8	10	
2403015	$MgWO_4$+Ge	CCD, SDD, SBD	8	328	I~1.2-0.8 nA; PIXE: I(WLb+GeKa)/I(WLa)~1.5; measurement stopped because current fell and could not be increased
After some time of trying it was not possible to get current higher than 0.8 nA from TDT control. We decided to check if everything is connected as it should be with the deflectors. -> It is all right. As we were checking cables there, Željko came and said that he didn't change any parameter but current suddenly increased to over 3 nA. Is it possible that some contact is bad and that the problem with the low current came because of that? We decided to not touch anything again and continue with the measurement, but contacts should be checked at some point. Andro's slits closed a bit for better focus.					
2403016	Cu mesh 400	SDD	/	/	SS=5x0.1
2403017	$MgWO_4$+Ge	CCD, SDD, SBD	8	544	I~2 nA; PIXE: I(WLb+GeKa)/I(WLa)~1
2403018	$MgWO_4$+Ge	CCD, SDD, SBD	8	360	I~2 nA
2403019	$MgWO_4$+Ge	CCD, SDD, SBD	8	180	I~2.2 nA
2403020	Cu mesh 400	SDD	/	/	SS=5x0.1, checking focus -> still good
2403021	MgO+Ge	CCD, SDD, SBD	5	520	I~2.8-3.2 nA; PIXE: I(GeKa)/I(GeLa+MgKa)~0.13
2403022	MgO+Ge	CCD, SDD, SBD	5	520	- || -; Spector file was not saved because Spector was not stopped before turning off the crate

Energy window used in Matlab analysis: [240, 360]

8.3.2024.

Beam: 3 MeV He^{2+} TDT

Focus: Me 20.4 A; Ox 42.9 A

Scanning: x=10.0, y=9.55

Diffraction crystal: ADP on 6 cm, peeking out of holder for 3 mm

Samples: Mg chunk - half clean Mg, half MgO (1), $MgWO_4$ (2), Mg+Ge (3), MgO+Ge (4), quartz (5), Cu mesh 400 (6)

Ge in mixtures is from Ge detector.

I~1.5 nA on metal before measurement

FILE	SAMPLE	DETECTOR	t_{exp}/s	N_{frames}	COMMENT
2403023	Cu mesh 400	SDD	/	/	SS=5x0.1
2403024	Mg	CCD	10	1	
2403025	$MgWO_4$	CCD	30	1	I~0.5 nA
2403026	DARK	CCD	10	10	
2403027	$MgWO_4$	CCD	10	600	I~0.8 nA
2403028	$MgWO_4$	CCD	10	400	I~0.9 nA