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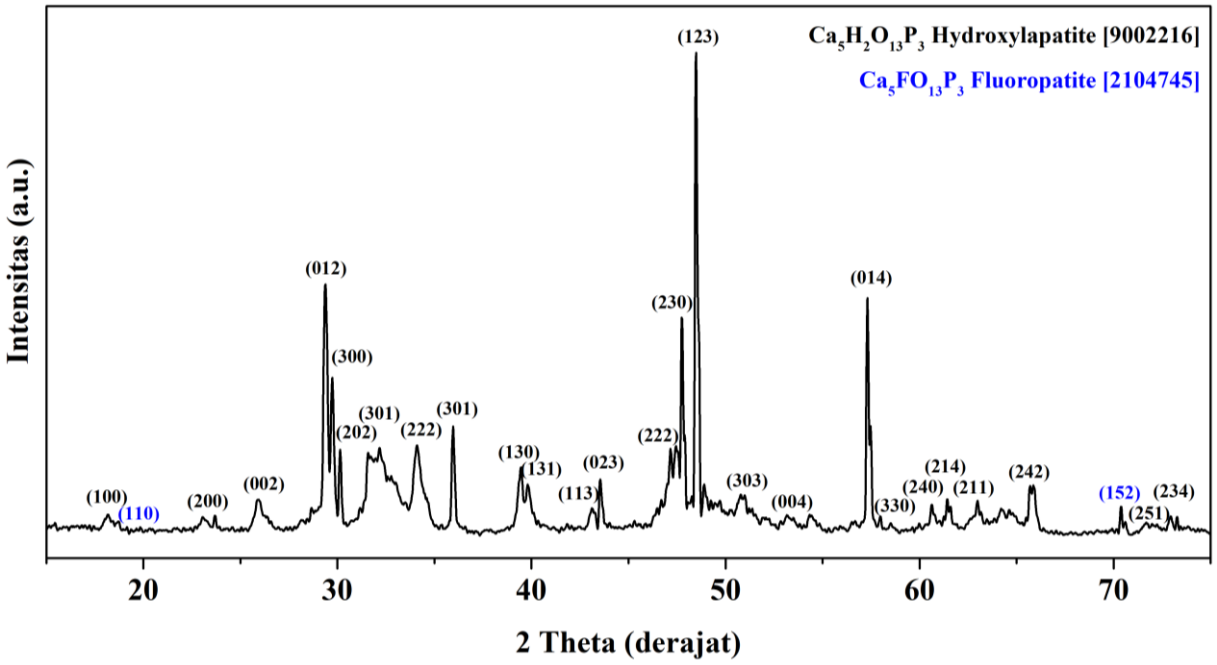
XRD Pattern



References

Formula sum	Ca5 H2 O13 P3
Entry number	96-900-2217
Figure-of-Merit (FoM)	0.867074
Total number of peaks	134
Peaks in range	73
Peaks matched	63
Intensity scale factor	1.00
Space group	P 63/m
Crystal system	hexagonal
Unit cell	a= 9.4232 Å c= 6.8833 Å
I/Icor	1.59
Calc. density	3.157 g/cm³
Reference	Wilson R. M., Elliot J. C., Dowker S. E. P., "Rietveld refinement of the crystallographic structure of human dental enamel apatites Sample: Prep.63b, synthetic", American Mineralogist **84**, 1406-1414 (1999)

Formula sum	Ca4.852 F0.89 O12 P3 Sr0.148
Entry number	96-900-1389
Figure-of-Merit (FoM)	0.783678
Total number of peaks	133
Peaks in range	72
Peaks matched	59
Intensity scale factor	1.35
Space group	P 63/m
Crystal system	hexagonal
Unit cell	a= 9.3786 Å c= 6.8922 Å
I/Icor	1.77
Calc. density	3.221 g/cm³
Reference	Hughes J M, Cameron M, Crowley K D, "Ordering of divalent cations in the apatite structure: Crystal structure refinements of natural Mn- and Sr-bearing apatite sample Sr.29", American Mineralogist **76**, 1857-1862 (1991)

Percentage

Hydroxyapatite = □ 92%

Fluoropatite = □8%

LABORATORIUM PENELITIAN DAN PENGEMBANGAN SAINS
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS HASANUDDIN
Jl. Perintis Kemerdekaan Km. 10 Tamalanrea, Makassar 90245
Telp. 0411-586016 • Fax. 0411-588551 • Email : lpps.fmipa.unhas@gmail.com

KAN
Komite Akreditasi Nasional
Laboratorium Penguji
LP-1484-IDN

LAPORAN HASIL PENGUJIAN

CERTIFICATE OF ANALYSIS

Nomor Pekerjaan : **LPPS.XJ-2305-8/1**

Job Number

Dipersembahkan Kepada
Presented To

Kepada Yth *Attention*	: **Nurul Annisa Aulia R**	**Jabatan** *Job Title*	: **Peneliti**
Nama Pelanggan *Customer Name*	: **Nurul Annisa Aulia R**	**Tujuan Pengujian** *Purpose of analysis*	: **Analisis Unsur**
Alamat/Universitas *Address/University*	: **Fakultas Teknik Universitas Hasanuddin**	**No. Faks/** *Fax No.*	: -
		No. Telp./ *Phone No.*	: **082348580738**
Tanggal Sampel Diterima *Date of Sample Receipt*	: **9 Mei 2023**	**Tanggal Sampel Dianalisis** *Date of Sample Analysed*	: **13 Mei 2023**
Email *Email*	: **nurulannisaaulia08@gmail.com**	**Total Halaman**	: **2**
Nama Pengujian *Name of analysis*	: **Analisis Sampel Bubuk Cangkang Kerang Darah dengan XRD**		

Hasil hanya berhubungan dengan contoh yang diuji dan laporan ini tidak boleh digandakan kecuali seluruhnya.
The result relate only to the samples tested and this report shall not be reproduced except in full

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Telp. 0411-586016 • Fax. 0411-588551 • Email : lpps.fmipa.unhas@gmail.com

LAPORAN HASIL PENGUJIAN

CERTIFICATE OF ANALYSIS

Nomor Pekerjaan : LPPS.XJ-2305-8/1

I. Pelanggan / *Principal*

1.1 Nama / *Name*	: Nurul Annisa Aulia R
1.2 Alamat / *Address*	: Jl. Dg Ngadde STP 8 No.3
1.3 Telepon / *Phone*	: 082348580738
1.4 Personil Penghubung / *Contact Person*	: -
1.5 Email / *Email*	: nurulannisaaulia08@gmail.com

II. Contoh Uji / *Sample*

2.1 Kode Sampel / *Sampel Code*	: LPPS.X-2305-8/1
2.2 Kemasan / *Packaging*	: Plastik
2.3 Nama Sampel / *Sample Name*	: Bubuk Cangkang Kerang Darah
2.4 Jumlah Sampel / *Number of Sample*	: 1
2.5 Tanggal Sampling / *Date of Sampling*	: -
2.6 Diterima / *Date of Received*	: 09 Mei 2023
2.7 Tanggal Uji / *Date of Analysis*	: 13 Mei 2023
2.8 Jenis Uji / *Type of Analysis*	: XRD

III. Hasil Uji / *Result*

Strongest 3 peaks

No.	Peak No.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1.	17	48.4751	1.87640	100	0.08140	684	2997
2.	21	57.3121	1.60630	47	0.08820	319	1579
3.	16	47.7542	1.90303	44	0.06740	300	1080

Makassar, 09 Juni 2023
Penanggung Jawab Mutu

Prof. Dr. Nunuk Hariani Soekamto, MS
NIP. 19601215 198702 2 001

Catatan:
- Hasil Uji hanya berlaku untuk contoh tersebut di atas
- Dilarang mengutip/menyalin sebagian isi hasil uji ini

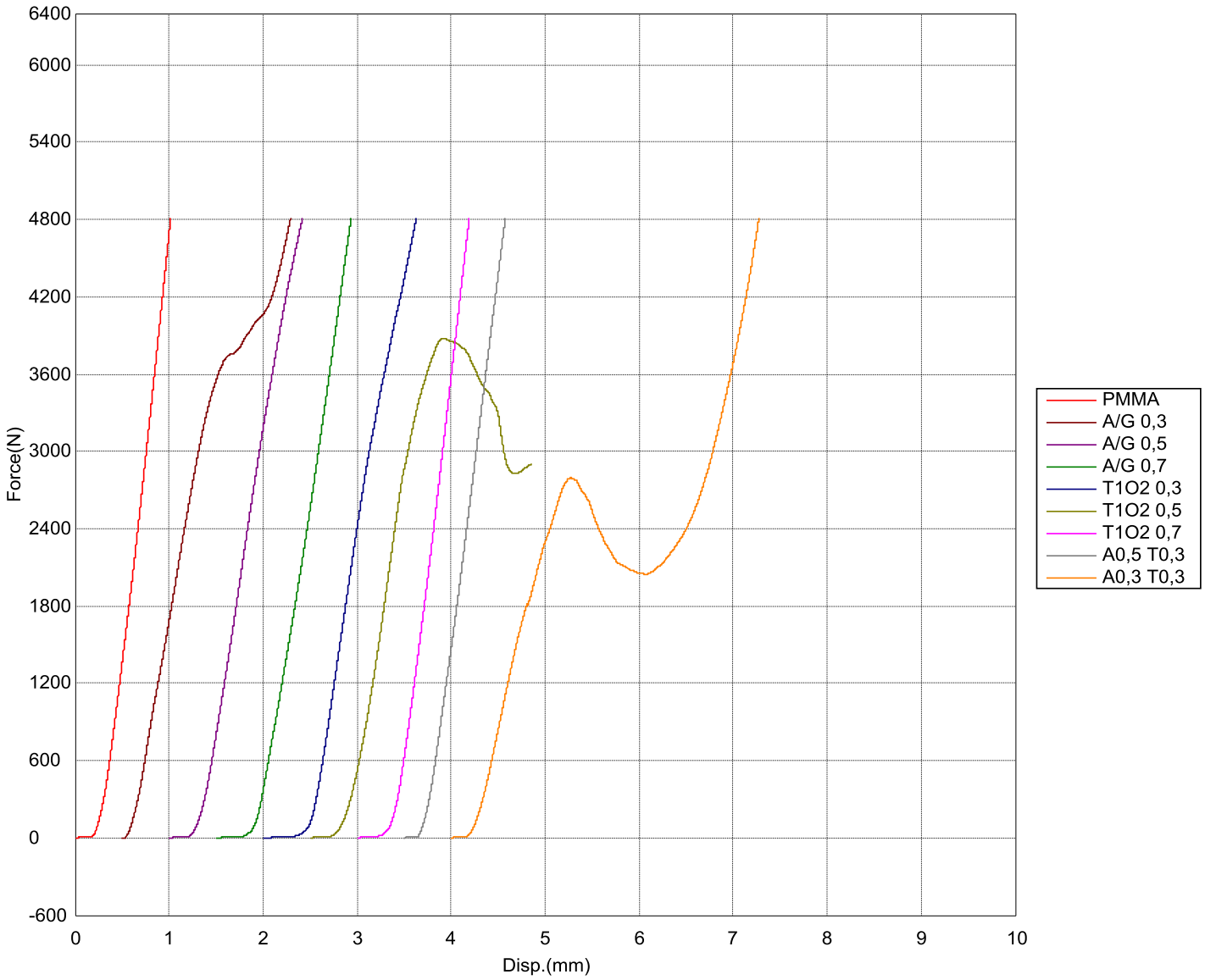
Key Word		**Product Name**	
Test File Name	Tekan.ltax	**Method File Name**	compress composit.lmax
Report Date	2214/01/02	**Test Date**	2214/01/02
Test Type	Compression	**Speed**	5mm/min
Shape	Plate	**No of Batches:**	1
Qty/Batch:	9		

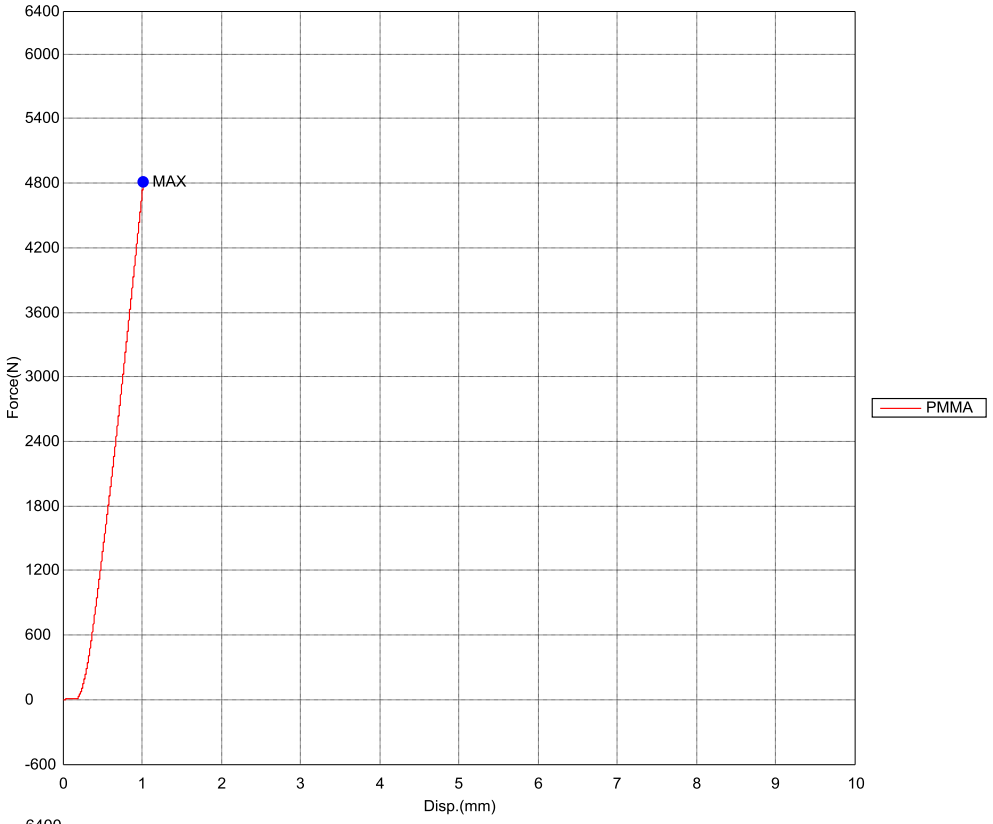
Name	Thickness	Width	Height
Unit	mm	mm	mm
PMMA	10.0000	10.0000	4.0000
A/G 0,3	9.5000	9.8000	2.7000
A/G 0,5	9.8000	10.0000	3.0000
A/G 0,7	10.0000	10.0000	3.5000
T1O2 0,3	9.7500	10.0000	4.0000
T1O2 0,5	10.0000	10.0000	4.0000
T1O2 0,7	10.0000	10.0000	4.0000
A0,5 T0,3	10.0000	10.0000	4.0000
A0,3 T0,3	10.0000	10.0000	4.0000

Name	Max_Force	Max_Disp.	Max_Stress	Break_Force
Parameters	Calc. at Entire Area	Calc. at Entire Area	Calc. at Entire Area	Sensitivity 10
Unit	N	mm	N/mm2	N
PMMA	4814.55	1.01730	48.1455	-.-
A/G 0,3	4809.58	1.79177	51.6603	-.-
A/G 0,5	4807.14	1.41793	49.0524	-.-
A/G 0,7	4812.03	1.43557	48.1203	-.-
T1O2 0,3	4807.88	1.62997	49.3116	-.-
T1O2 0,5	3873.70	1.41530	38.7370	-.-
T1O2 0,7	4812.13	1.19243	48.1213	-.-
A0,5 T0,3	4812.10	1.07633	48.1210	-.-
A0,3 T0,3	4808.86	3.27247	48.0886	-.-

Name	Break_Disp.
Parameters	Sensitivity 10
Unit	mm
PMMA	-.-
A/G 0,3	-.-
A/G 0,5	-.-
A/G 0,7	-.-
T1O2 0,3	-.-
T1O2 0,5	-.-
T1O2 0,7	-.-
A0,5 T0,3	-.-
A0,3 T0,3	-.-

Name		Max_Force		Max_Disp.	Max_Stress	Break_Force	Break_Disp.
Parameter		Calc. at Entire Areas		Calc. at Entire Areas	Calc. at Entire Areas	Sensitivity 10	Sensitivity 10
Pass/Fail							
Unit		N	mm	N/mm2	N	mm	
Print		True	True	True	True	True	
PMMA	True	4814.55	1.01730	48.1455	-.-	-.-	
A/G 0,3	True	4809.58	1.79177	51.6603	-.-	-.-	
A/G 0,5	True	4807.14	1.41793	49.0524	-.-	-.-	
A/G 0,7	True	4812.03	1.43557	48.1203	-.-	-.-	
T1O2 0,3	True	4807.88	1.62997	49.3116	-.-	-.-	
T1O2 0,5	True	3873.70	1.41530	38.7370	-.-	-.-	
T1O2 0,7	True	4812.13	1.19243	48.1213	-.-	-.-	
A0,5 T0,3	True	4812.10	1.07633	48.1210	-.-	-.-	
A0,3 T0,3	True	4808.86	3.27247	48.0886	-.-	-.-	

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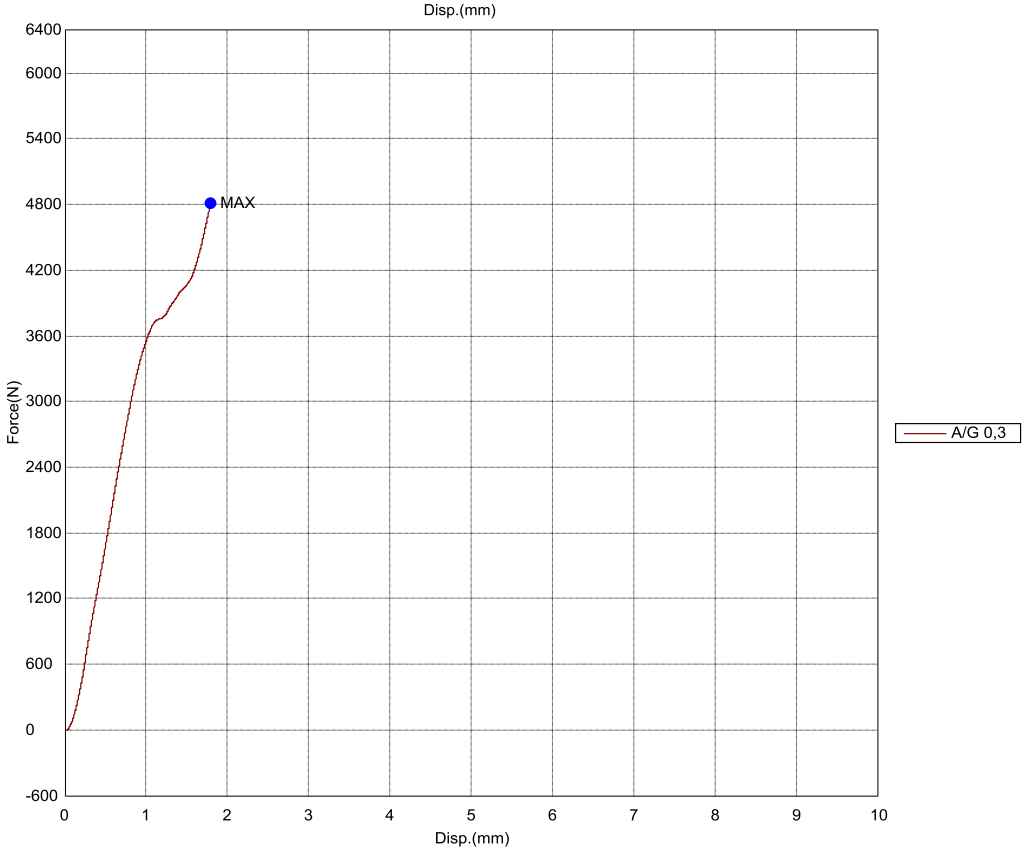
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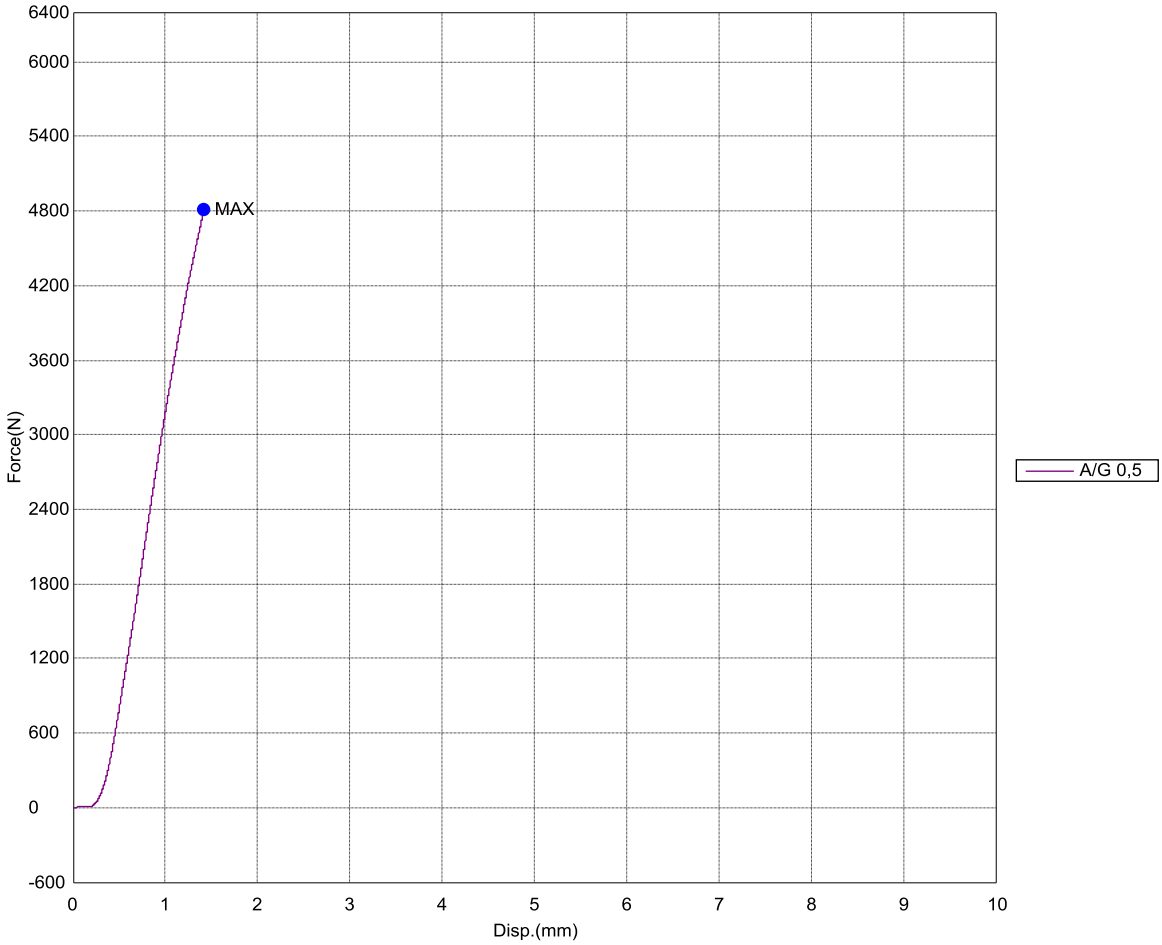
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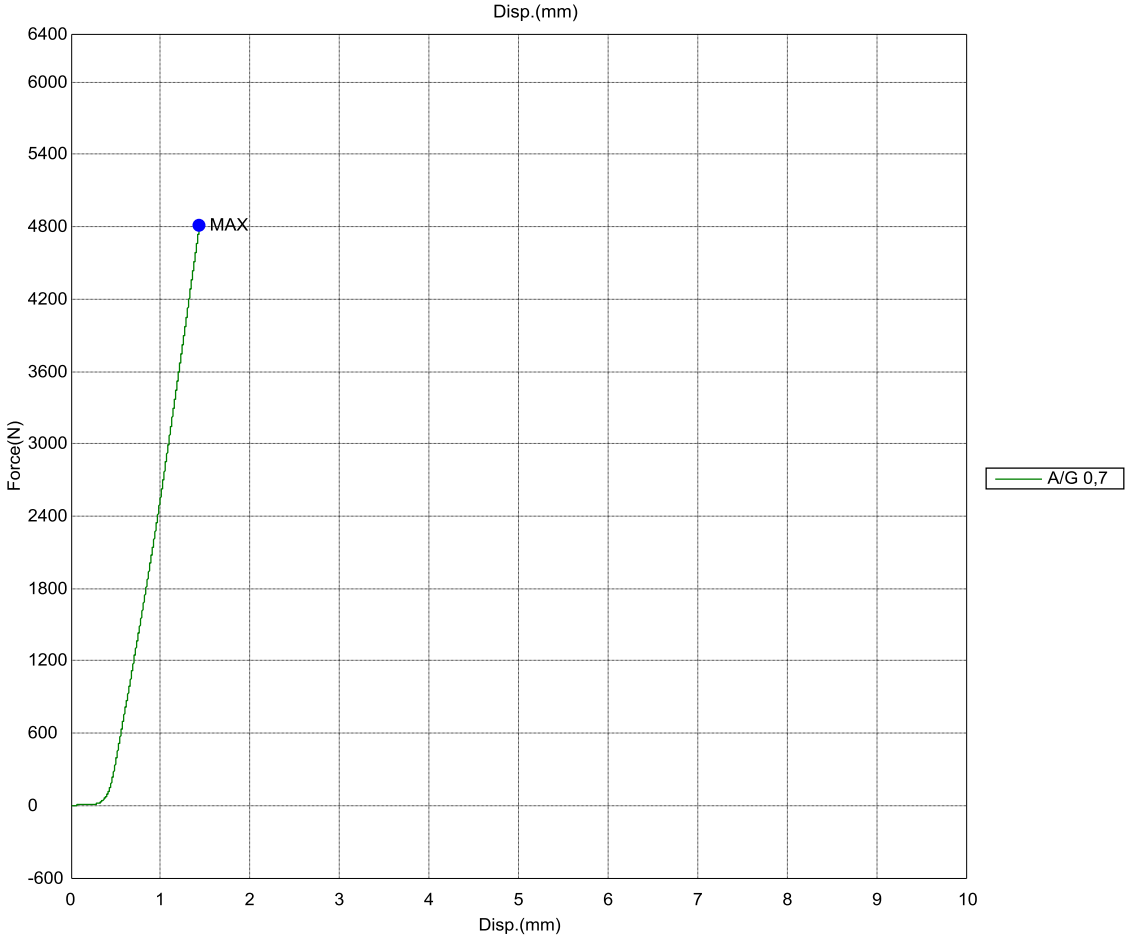
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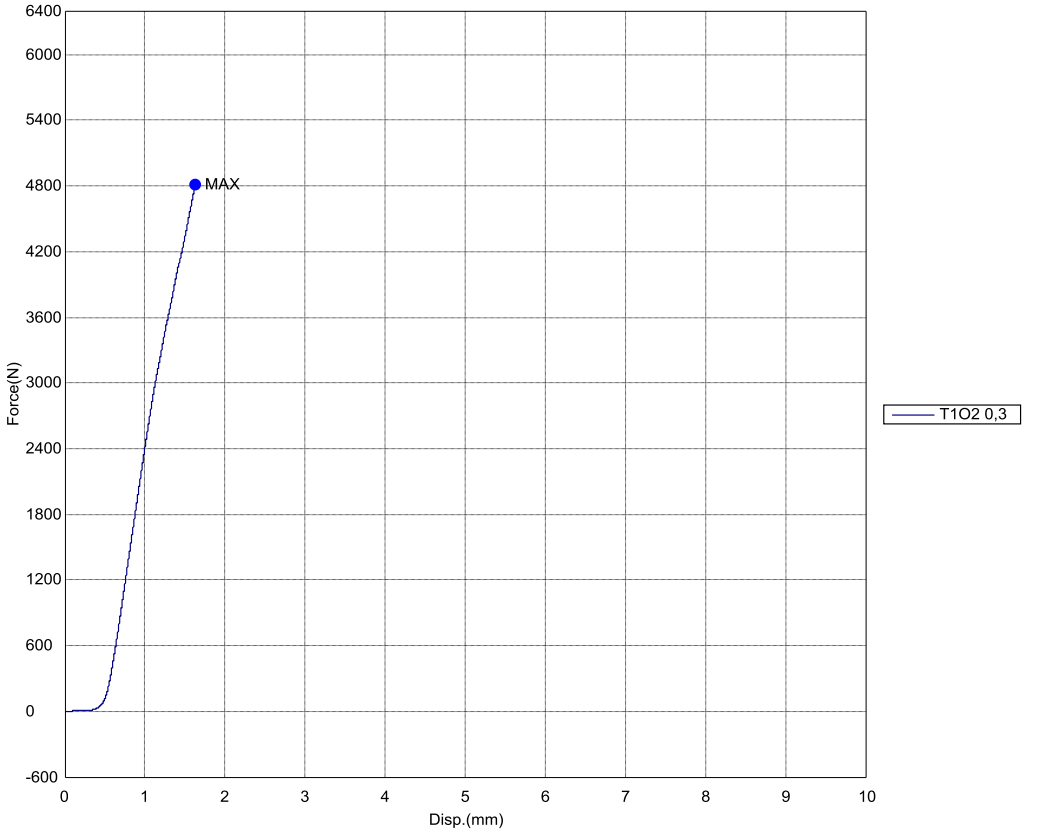
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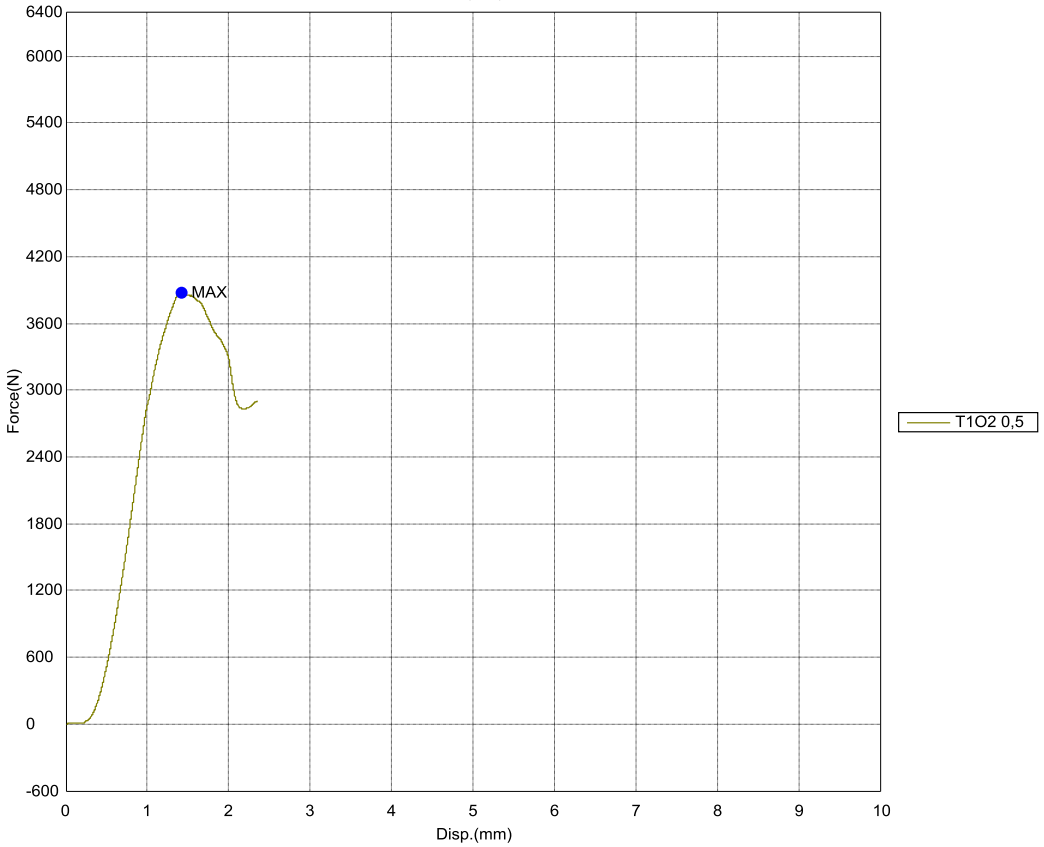
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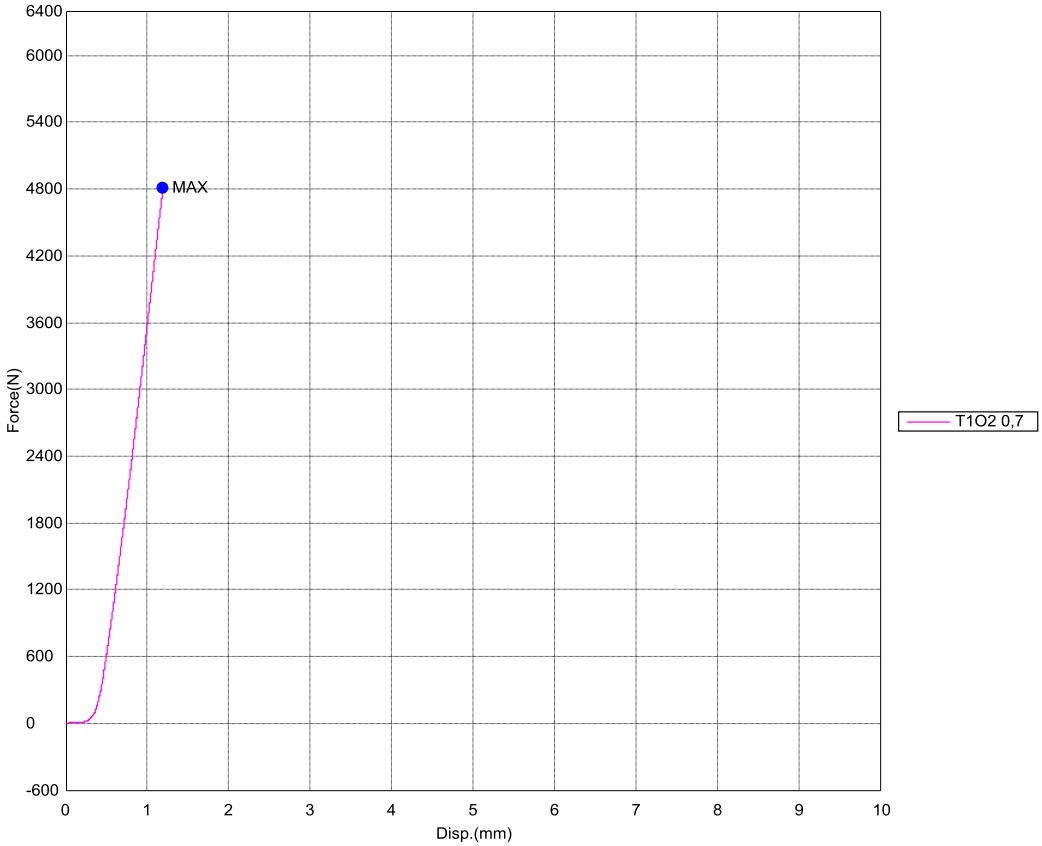
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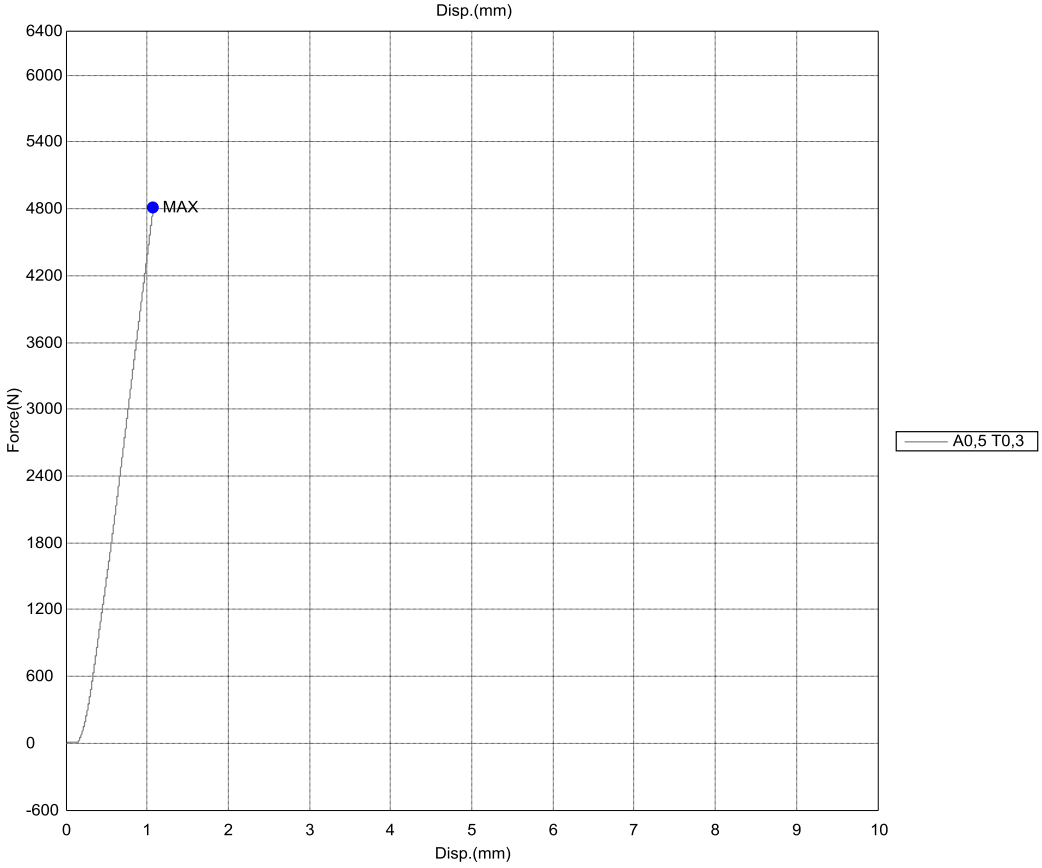
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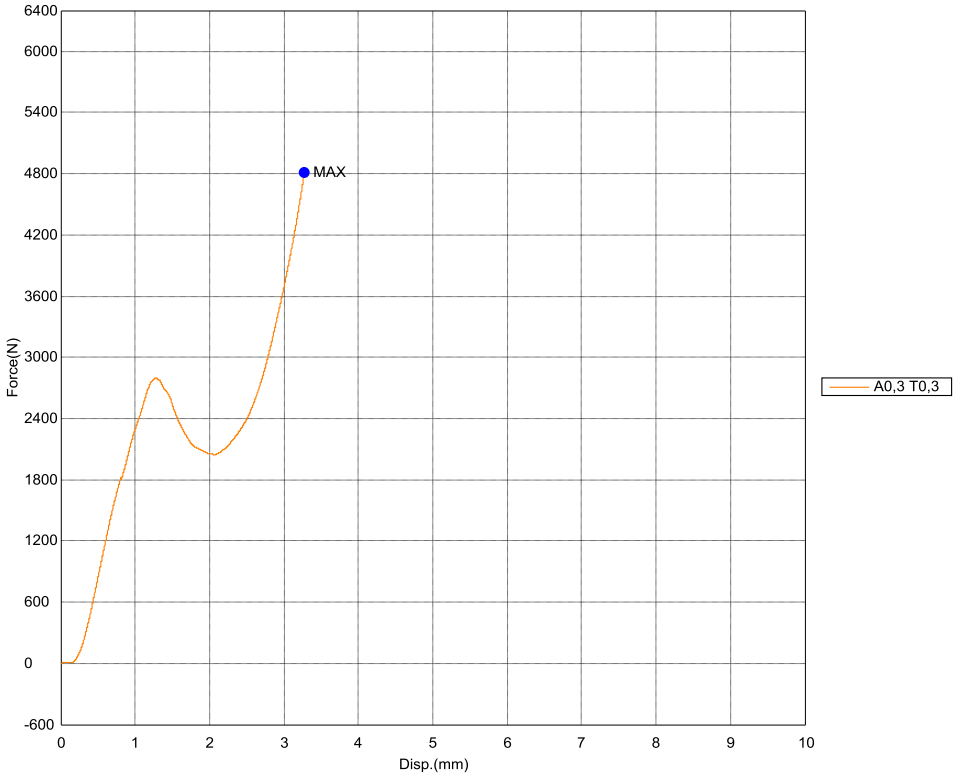
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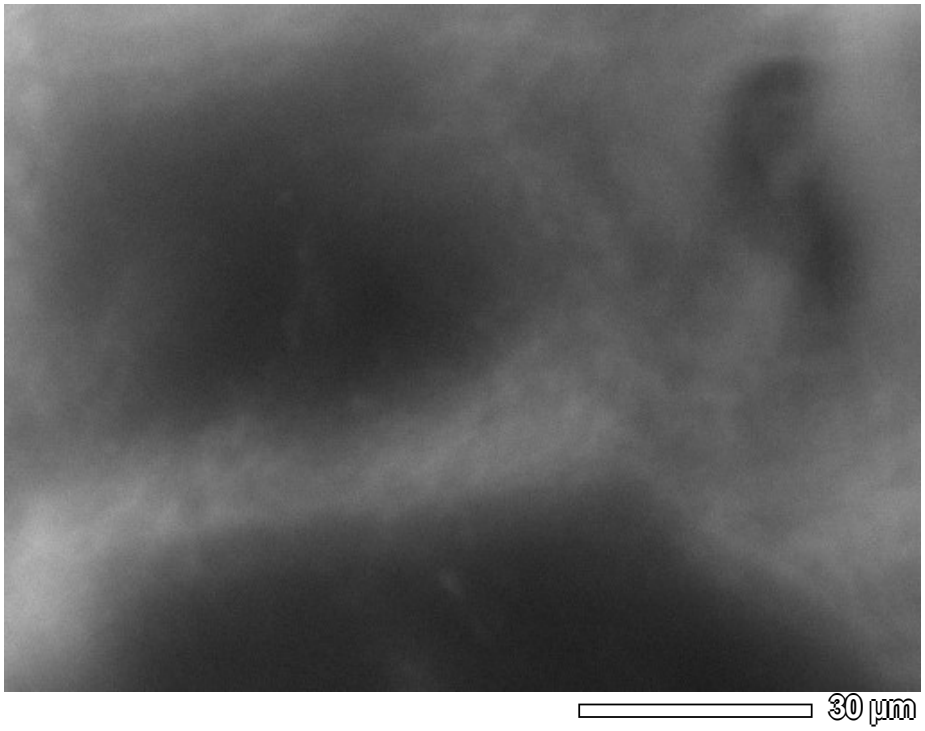
View001



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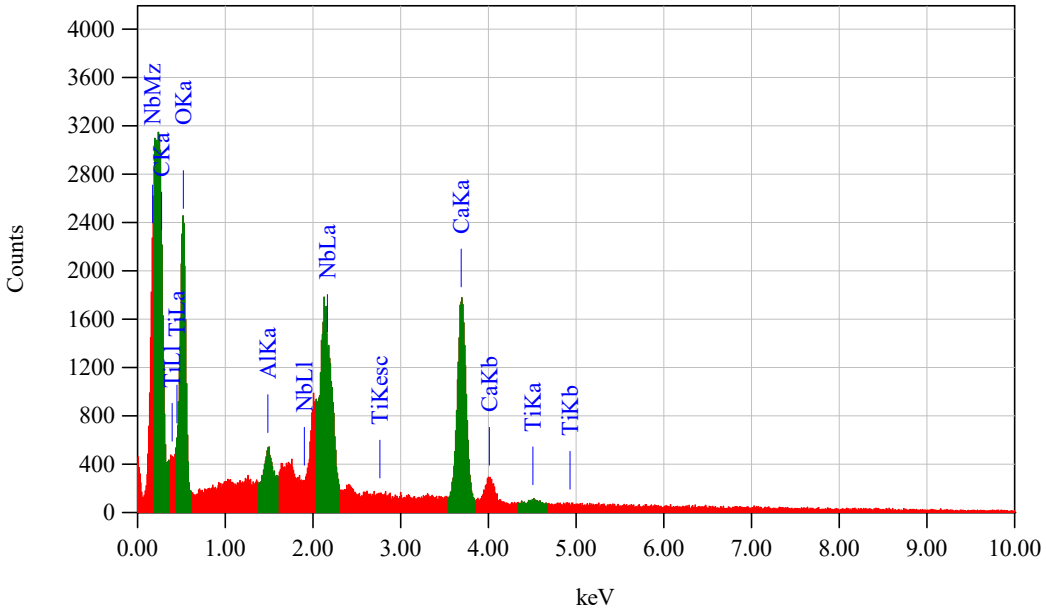
Pixel	: 512 x 384



Acquisition Parameter

Instrument	: JCM-6000PLUS
Acc. Voltage	: 15.0 kV
Probe Current	: 1.00000 nA
PHA mode	: T3
Real Time	: 50.75 sec
Live Time	: 50.00 sec
Dead Time	: 1 %
Counting Rate	: 4358 cps
Energy Range	: 0 - 20 keV

Thin Film Standardless Standardless Quantitative Analysis(Oxide)
Fitting Coefficient : 0.3537
Total Oxide : 24.0

Element	(keV)	Mass%	Counts	Sigma	Mol%	Compound	Mass%	Cation	K
C K	0.277	9.23	2618.06	0.12	42.83	C	9.23	0.00	1.8764
O		27.45					ND		
Al K*	1.486	2.24	2070.23	0.18	2.31	Al2O3	4.22	1.16	0.5750
Ca K (Ref.)	3.690	32.84	17489.86	0.51	45.70	CaO	45.95	11.46	1.0000
Ti K	4.508	0.80	320.55	0.15	0.93	TiO2	1.33	0.23	1.3236
Nb L	2.166	27.45	5863.69	0.87	8.24	Nb2O5	39.27	4.13	2.4929
Total		100.00			100.00		100.00	16.99	

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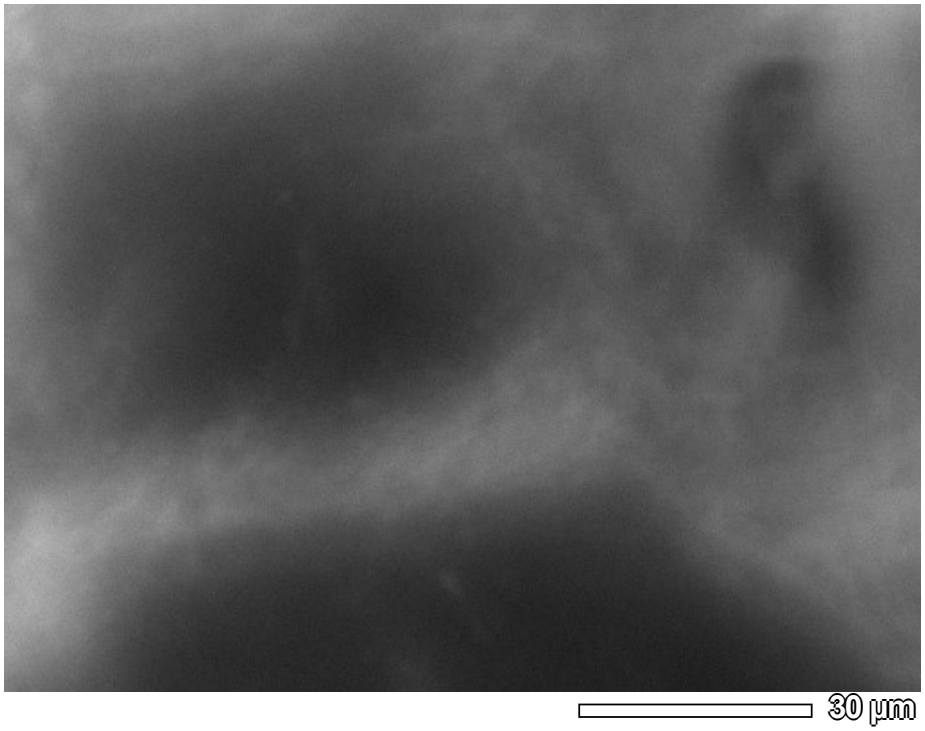
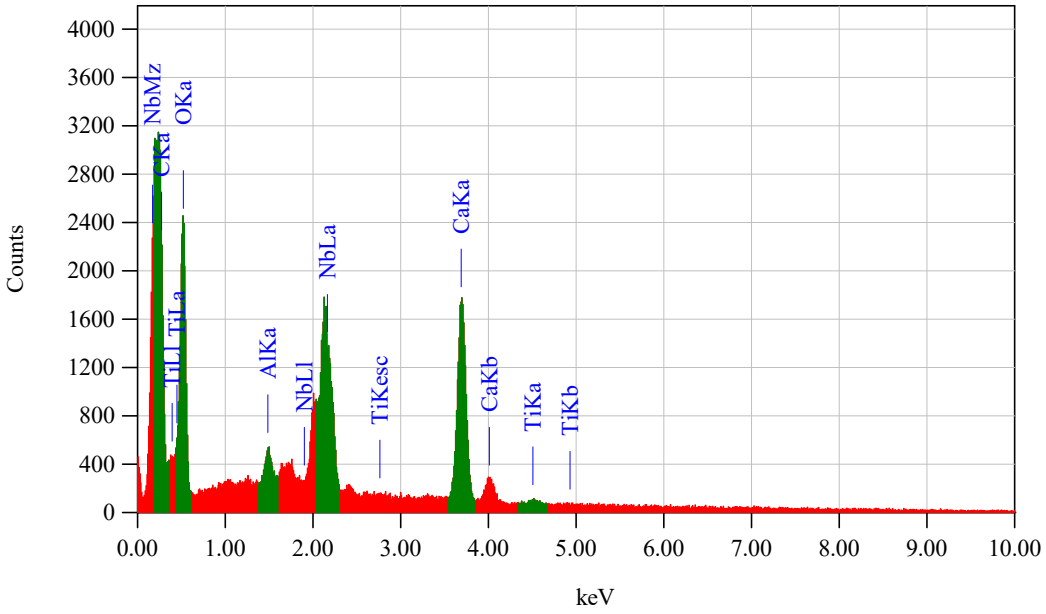


Title	: IMG1
Instrument	: JCM-6000PLUS
Volt	: 15.00 kV
Mag.	: x 1,000
Date	: 2024/01/10
Pixel	: 512 x 384

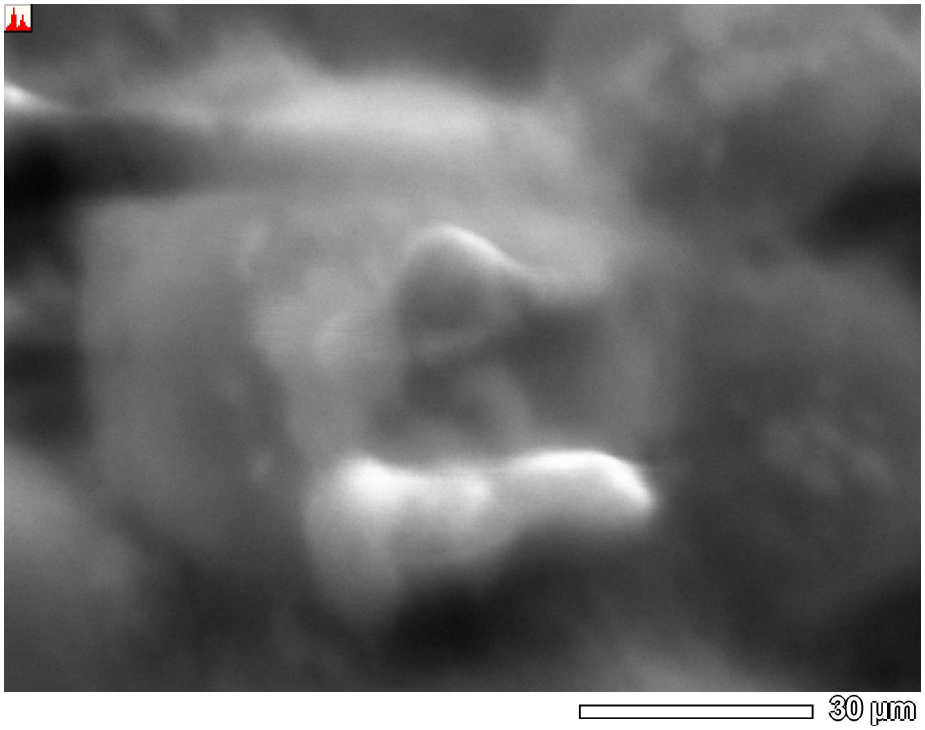


Acquisition Parameter
Instrument : JCM-6000PLUS
Acc. Voltage : 15.0 kV
Probe Current: 1.00000 nA
PHA mode : T3
Real Time : 50.75 sec
Live Time : 50.00 sec
Dead Time : 1 %
Counting Rate: 4358 cps
Energy Range : 0 - 20 keV

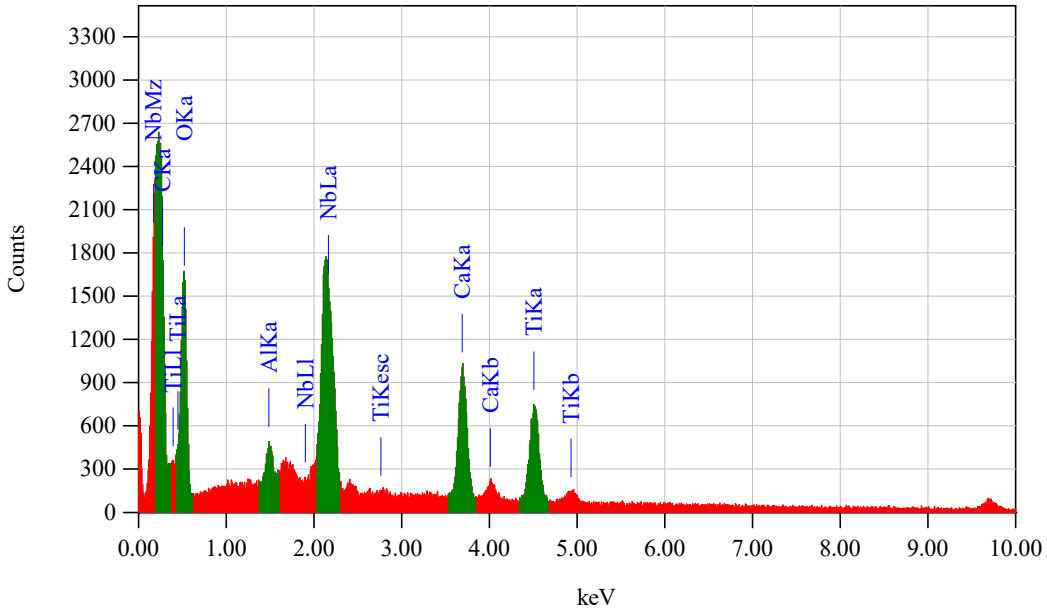
Thin Film Standardless Standardless Quantitative Analysis
Fitting Coefficient : 0.3537

Element	(keV)	Mass%	Counts	Sigma	Atom%	Compound	Mass%	Cation	K
C K	0.277	10.29	2618.06	0.13	25.16				1.8764
O K	0.525	19.09	12557.16	0.19	35.05				0.7260
Al K*	1.486	2.49	2070.23	0.11	2.71				0.5750
Ca K (Ref.)	3.690	36.63	17489.86	0.41	26.85				1.0000
Ti K	4.508	0.89	320.55	0.10	0.55				1.3236
Nb L	2.166	30.61	5863.69	0.68	9.68				2.4929
Total		100.00			100.00				

View000



Title	: IMG1
Instrument	: JCM-6000PLUS
Volt	: 15.00 kV
Mag.	: x 1,000
Date	: 2024/01/09
Pixel	: 512 x 384

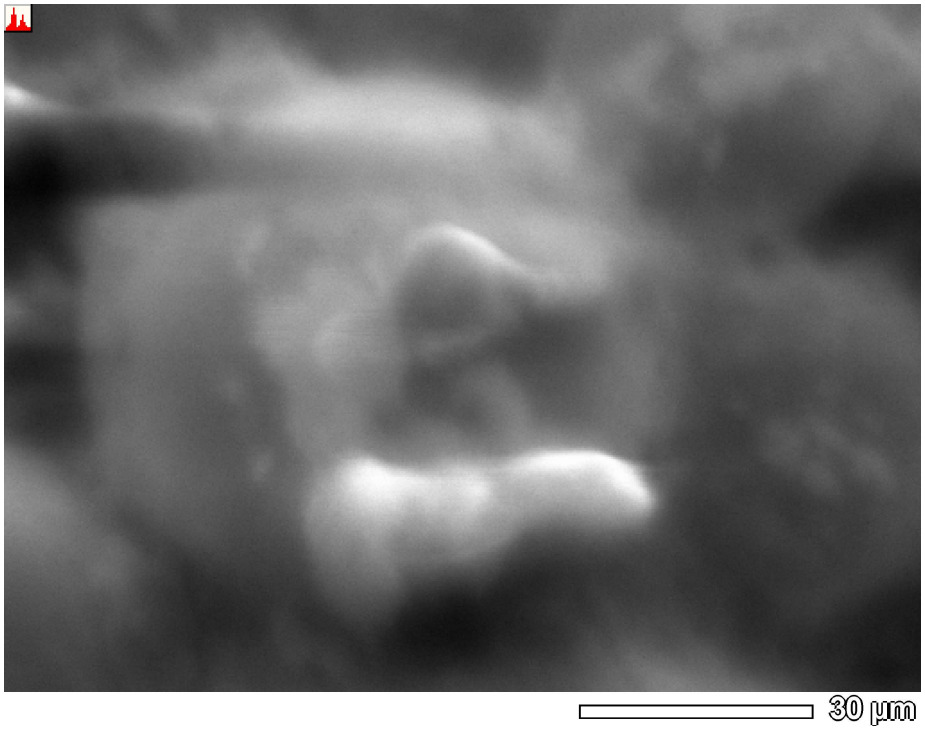


Acquisition Parameter
Instrument : JCM-6000PLUS
Acc. Voltage : 15.0 kV
Probe Current: 1.00000 nA
PHA mode : T3
Real Time : 51.34 sec
Live Time : 50.00 sec
Dead Time : 2 %
Counting Rate: 4062 cps
Energy Range : 0 - 20 keV

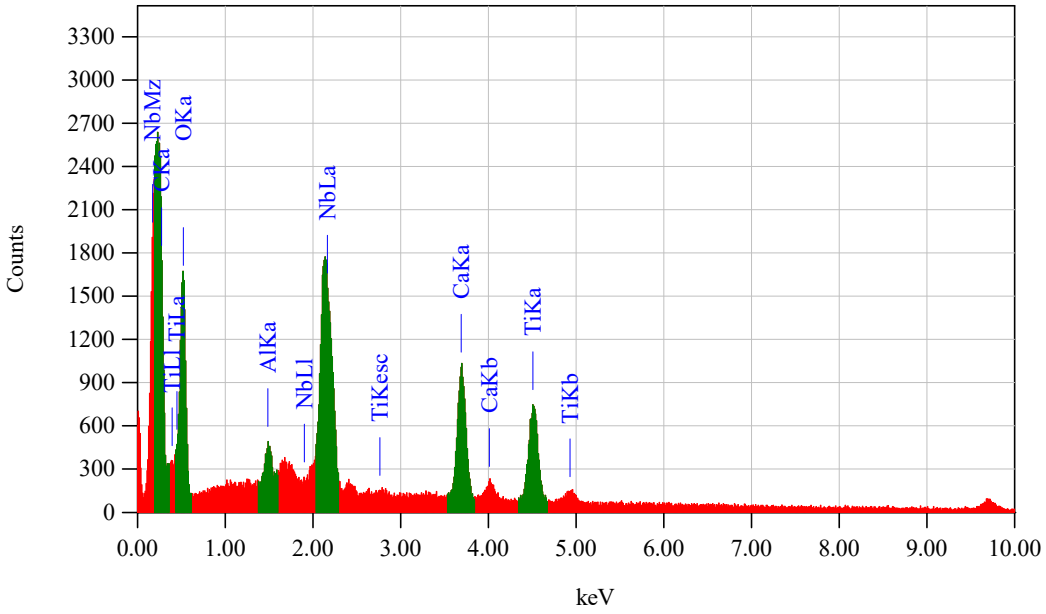
Thin Film Standardless Standardless Quantitative Analysis(Oxide)
Fitting Coefficient : 0.4023
Total Oxide : 24.0

Element	(keV)	Mass%	Counts	Sigma	Mol%	Compound	Mass%	Cation	K
C K	0.277	6.86	2234.27	0.10	38.31	C	6.86	0.00	1.8764
O *		31.06					ND		
Al K*	1.486	1.91	2027.00	0.15	2.37	Al2O3	3.61	0.87	0.5750
Ca K* (Ref.)	3.690	15.53	9485.36	0.33	25.97	CaO	21.73	4.79	1.0000
Ti K*	4.508	16.59	7654.67	0.46	23.23	TiO2	27.68	4.28	1.3236
Nb L*	2.166	28.05	6873.54	0.78	10.12	Nb2O5	40.13	3.73	2.4929
Total		100.00			100.00		100.00	13.68	

View000



Title	: IMG1
Instrument	: JCM-6000PLUS
Volt	: 15.00 kV
Mag.	: x 1,000
Date	: 2024/01/09
Pixel	: 512 x 384



Acquisition Parameter
Instrument : JCM-6000PLUS
Acc. Voltage : 15.0 kV
Probe Current: 1.00000 nA
PHA mode : T3
Real Time : 51.34 sec
Live Time : 50.00 sec
Dead Time : 2 %
Counting Rate: 4062 cps
Energy Range : 0 - 20 keV

Thin Film Standardless Standardless Quantitative Analysis
Fitting Coefficient : 0.4023

Element	(keV)	Mass%	Counts	Sigma	Atom%	Compound	Mass%	Cation	K
C K	0.277	8.71	2234.27	0.12	24.88				1.8764
O K*	0.525	12.55	8323.54	0.16	26.93				0.7260
Al K*	1.486	2.42	2027.00	0.10	3.08				0.5750
Ca K* (Ref.)	3.690	19.70	9485.36	0.30	16.87				1.0000
Ti K*	4.508	21.04	7654.67	0.35	15.09				1.3236
Nb L*	2.166	35.58	6873.54	0.69	13.15				2.4929
Total		100.00			100.00				