

Perhitungan Fraksi Volume Komposit Al/Al₂O₃

Kode Sampel	Berat Al (gram)	Berat Al ₂ O ₃ (gram)	Volume Al (cm ³)	Volume Al ₂ O ₃ (cm ³)	Fraksi Volume (%)
A1	2000	56.3	740.7407407	14.81578947	2.000131579
A2	2000	253	740.7407407	66.57894737	8.988157895
A3	2000	351	740.7407407	92.36842105	12.46973684
A4	2000	506.6	740.7407407	133.3157895	17.99763158
A5	2000	633.3	740.7407407	166.6578947	22.49881579

Fraksi Volume : Volume penguat / volume komposit
: Volume Al₂O₃ / Volume Total

Hasil Perhitungan Densitas dan Porositas Komposit Al/Al₂O₃

Kode Sampel	Wd (gram)	Wa (gram)	V	Db	Dt	Porositas (%)
A1	8.7	3.35	3.35	2.597014925	2.721570019	4.5765897
A2	7.2	2.66	2.66	2.706766917	2.790716036	3.00815697
A3	9.55	3.6	3.6	2.652777778	2.821959124	5.99517351
A4	11.1	4.22	4.22	2.630331754	2.867777899	8.27979551
A5	8.59	3.3	3.3	2.603030303	2.902032136	10.3031882

Keterangan :

Wd : berat kering

Wa : berat dalam air

V : volume sampel

Db : densitas percobaan

Db : berat kering / volume sampel = Wd / V

Dt : densitas teoritis

HASIL UJI KEKERASAN MAKRO

:
 Metode : Brinell
 Diameter : 2,5
 Indentor : mm
 : 62,5
 Beban : Kg
 Jenis Sampel : Komposit Al/Al₂O₃ (as-cast)

Sampel	d1 (mm)	d2 (mm)	d rata-rata (mm)	Kekerasan (BHN)	Kekerasan Rata-rata (BHN)
A0	0.84	0.84	0.84	110	107.6
	0.85	0.84	0.845	104	
	0.85	0.84	0.845	104	
	0.84	0.84	0.84	110	
	0.84	0.84	0.84	110	
A1	0.84	0.84	0.84	110	105.4
	0.86	0.85	0.855	104	
	0.85	0.85	0.85	107	
	0.85	0.86	0.855	104	
	0.86	0.88	0.87	102	
A2	0.78	0.79	0.785	128	131.8
	0.77	0.77	0.77	131	
	0.76	0.78	0.77	131	
	0.75	0.75	0.75	138	
	0.77	0.77	0.77	131	
A3	0.78	0.81	0.795	121	128.4
	0.77	0.78	0.775	131	
	0.79	0.78	0.785	128	
	0.78	0.77	0.775	131	
	0.78	0.77	0.775	131	
A4	0.81	0.78	0.795	124	120.4
	0.8	0.8	0.8	121	
	0.81	0.8	0.805	121	
	0.83	0.82	0.825	115	
	0.81	0.8	0.805	121	
A5	0.83	0.84	0.835	112	114.6
	0.83	0.85	0.84	110	
	0.81	0.82	0.815	118	
	0.82	0.81	0.815	118	
	0.82	0.83	0.825	115	

HASIL UJI KEKERASAN MAKRO

Metode : Brinell
 Diameter Indentor : 2,5 mm
 Beban : 62,5 Kgf
 Jenis Sampel : Komposit Al/Al₂O₃
 : A4 aging 1 s.d 7 jam
 : A5 aging 1 s.d 7 jam

Sampel	d1 (mm)	d2 (mm)	d rata (mm)	Kekerasan (BHN)	Kekerasan Rata-rata (BHN)
A4-0	0.92	0.92	0.92	90.77	93.59
	0.9	0.9	0.9	95.00	
	0.9	0.9	0.9	95.00	
A4-1	0.82	0.81	0.815	116.59	114.67
	0.82	0.82	0.82	115.13	
	0.83	0.83	0.83	112.29	
A4-3	0.79	0.8	0.795	122.70	122.71
	0.79	0.81	0.8	121.13	
	0.79	0.79	0.79	124.30	
A4-5	0.84	0.85	0.845	108.22	110.03
	0.84	0.84	0.84	109.56	
	0.83	0.83	0.83	112.29	
A4-7	0.87	0.87	0.87	101.90	102.31
	0.86	0.87	0.865	103.12	
	0.87	0.87	0.87	101.90	
A5-0	0.83	0.84	0.835	110.91	110.51
	0.85	0.85	0.85	106.92	
	0.82	0.83	0.825	113.70	
A5-1	0.83	0.82	0.825	113.70	114.66
	0.82	0.82	0.82	115.13	
	0.82	0.82	0.82	115.13	
A5-3	0.81	0.815	0.8125	117.33	119.10
	0.805	0.81	0.8075	118.83	
	0.8	0.8	0.8	121.13	
A5-5	0.81	0.81	0.81	118.08	118.09
	0.81	0.82	0.815	116.59	
	0.8	0.81	0.805	119.59	
A5-7	0.85	0.85	0.85	106.92	106.07
	0.85	0.85	0.85	106.92	
	0.87	0.85	0.86	104.36	

HASIL UJI TARIK UNIAKSIAL

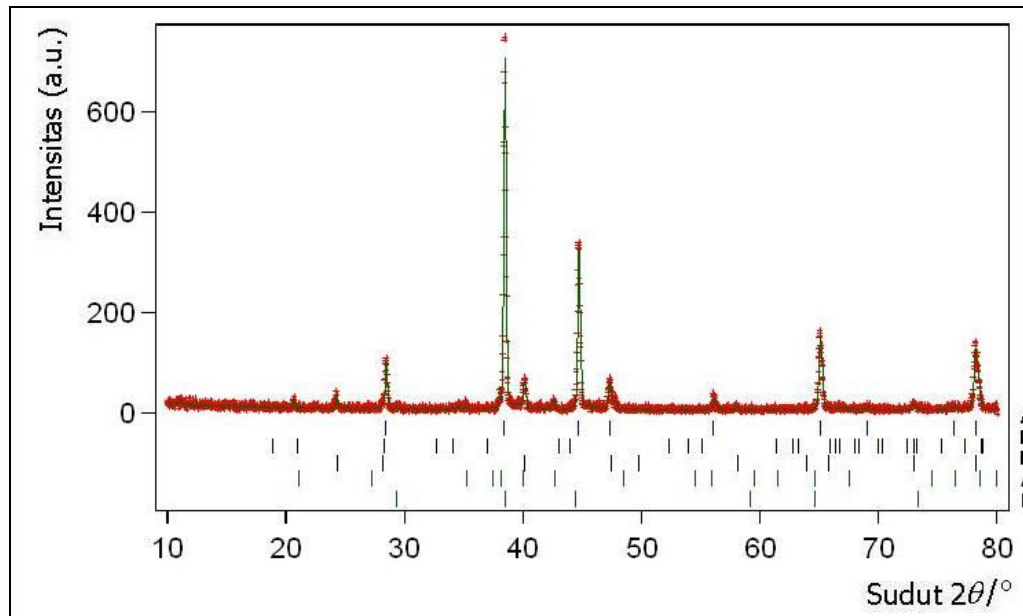
Jenis Sampel : Komposit
 Al/Al₂O₃
 Kode Sampel : A0 s.d A5
 Tempat Uji : DTMM FTUI
 Tanggal Uji : 22 Maret 2010
 Teknisi : Bpk Nudin

Sampel	LO (mm)	A0 (mm ²)	Lt (mm)	Beban (Kgf)	UTS (Kgf/mm ²)	UTS RATA	
						(Kgf/mm ²)	(Mpa)
A0	50	161.65	-	3200	19.80	20.72	203.09415
	50	161.65	-	3500	21.65		
A1	50	153.86	-	2300	14.95	17.06	167.20
	50	153.86	-	2950	19.17		
A2	50	153.86	-	2800	18.20	19.17	187.90
	50	153.86	-	3100	20.15		
A3	50	153.86	-	3200	20.80	21.77	213.38
	50	153.86	-	3500	22.75		
A4	50	153.86	-	2300	14.95	15.60	152.87
	50	153.86	-	2500	16.25		
A5	50	153.86	-	1550	10.07	15.38	150.74
	50	153.86	-	2550	16.57		
	50	153.86	-	3000	19.50		

HASIL ANALISIS/UJI

TEST/ANALYSIS RESULT

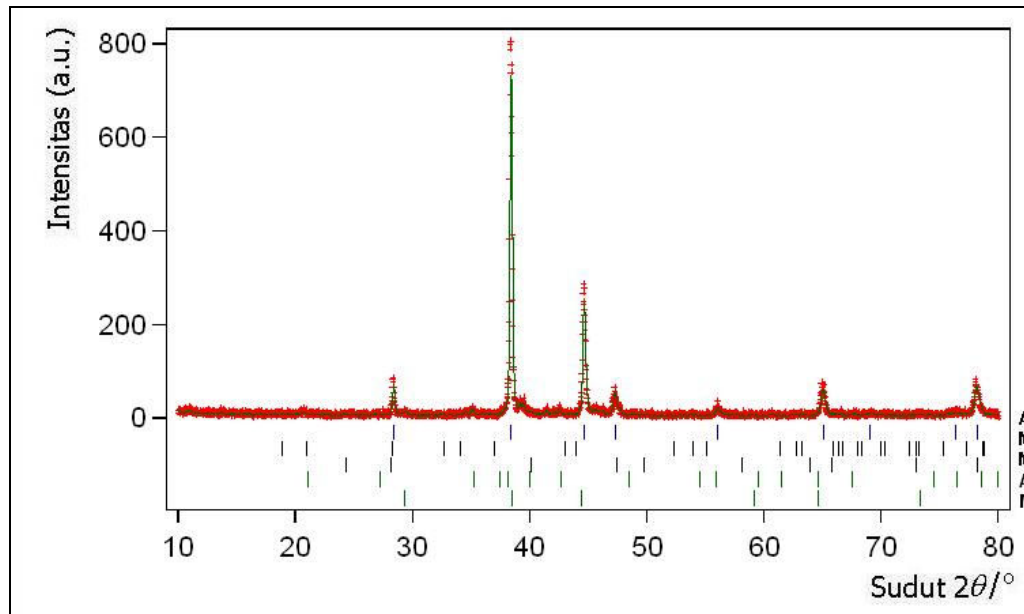
Profil difraksi sinar-x sampel 1
x-ray diffraction profile sample 1



Analisis peaks sample 1
Peaks analysis sample 1

No.	Pos. [°2 θ .]	FWHM [°2 θ .]	Area [cts*°2 θ .]	Backgr.[cts]	d-spacing [Å]	Height [cts]	Rel. Int. [%]
1	20.6416	0.4723	5.46	10	4.30307	11.71	1.55
2	24.2227	0.2362	6.15	9	3.67442	26.4	3.48
3	28.4251	0.1968	19.55	7	3.14002	100.7	13.29
4	34.7364	0.9446	6.25	6	2.58261	6.7	0.88
5	38.4459	0.1968	147.11	7	2.34153	757.79	100
6	40.0843	0.2362	13.71	7	2.24952	58.85	7.77
7	42.5676	0.2362	4.18	7	2.12387	17.95	2.37
8	44.6765	0.2755	91.48	7	2.02839	336.59	44.42
9	47.3411	0.1968	10.7	7	1.92025	55.1	7.27
10	56.1369	0.2362	5.21	6	1.63846	22.35	2.95
11	65.0197	0.2362	34.19	6	1.43445	146.78	19.37
12	72.9693	0.4723	5.8	6	1.29655	12.44	1.64
13	78.1722	0.576	93.42	8	1.22175	121.64	16.05

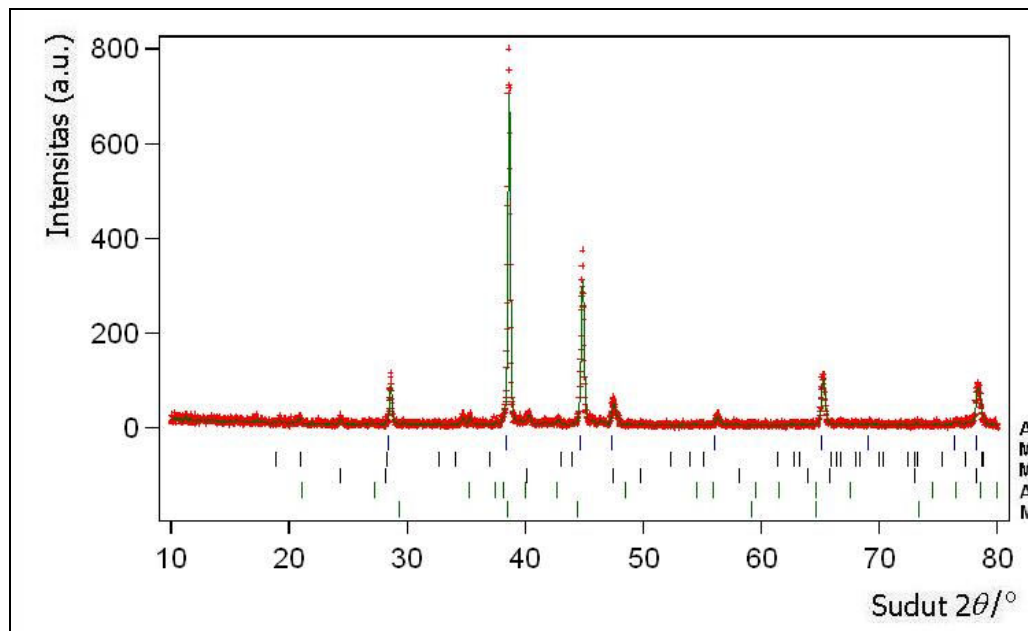
Profil difraksi sinar-x sampel 2
x-ray diffraction profile sample 2



Analisis peaks sample 2
Peaks analysis sample 2

No.	Pos. [°2 θ .]	FWHM [°2 θ .]	Area [cts*°2 θ .]	Backgr.[cts]	d-spacing [Å]	Height [cts]	Rel. Int. [%]
1	20.6436	0.4723	2.94	8	4.30267	6.32	0.78
2	28.3569	0.2362	15.95	6	3.14741	68.45	8.48
3	35.0635	0.2362	3.54	7	2.55926	15.21	1.89
4	38.3863	0.1968	156.64	8	2.34503	806.85	100
5	42.5243	0.2362	3.39	8	2.12592	14.54	1.8
6	44.5872	0.2755	69.01	7	2.03224	253.9	31.47
7	47.2767	0.2755	14.08	7	1.92272	51.82	6.42
8	56.0382	0.3149	6.65	5	1.64111	21.4	2.65
9	64.9141	0.1968	10.78	5	1.43653	55.55	6.89
10	76.1734	0.9446	6.25	6	1.24979	6.71	0.83
11	78.0689	0.24	21.9	6	1.22311	68.43	8.48

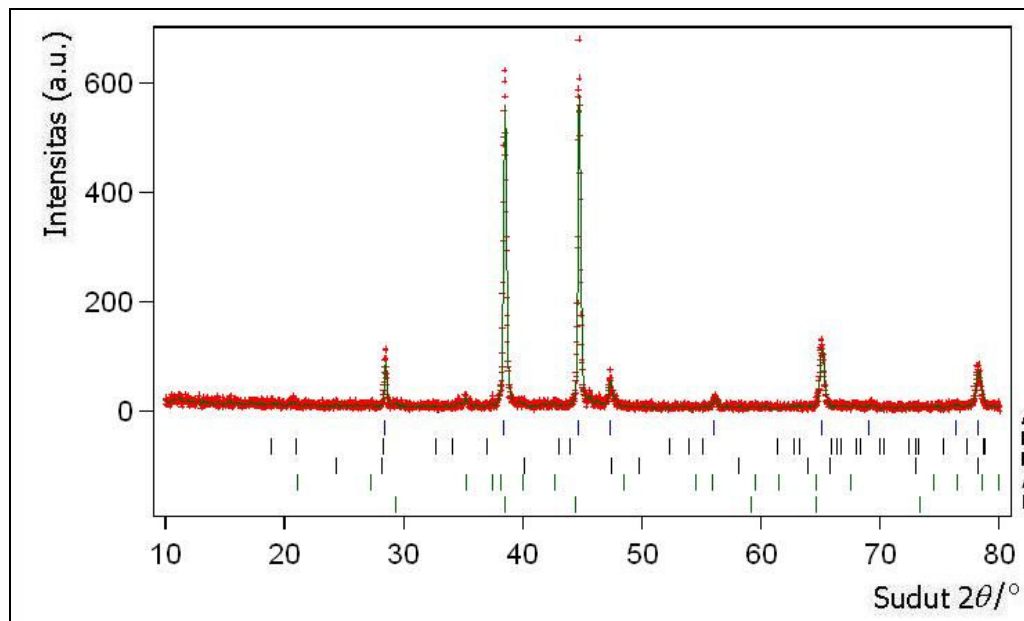
Profil difraksi sinar-x sampel 3
x-ray diffraction profile sample 3



Analisis peaks sample 3
Peaks analysis sample 3

No.	Pos. [°2Th.]	FWHM [°2Th.]	Area [cts*°2Th.]	Backgr.[cts]	d-spacing [Å]	Height [cts]	Rel. Int. [%]
1	20.7932	0.4723	4.59	10	4.27205	9.85	1.29
2	24.3579	0.2362	2.63	9	3.65432	11.28	1.48
3	28.5883	0.1968	19.44	8	3.12246	100.15	13.16
4	34.66	0.2362	3.57	7	2.58812	15.33	2.01
5	35.3063	0.2362	4.78	7	2.54222	20.5	2.69
6	38.6068	0.2362	177.23	8	2.33214	760.79	100
7	40.2916	0.2362	4.68	8	2.23843	20.09	2.64
8	42.7833	0.4723	4.47	8	2.11365	9.59	1.26
9	44.8194	0.2362	78.85	7	2.02225	338.47	44.49
10	47.4568	0.3149	15.24	6	1.91584	49.05	6.45
11	56.2714	0.3149	6.6	6	1.63486	21.24	2.79
12	65.1409	0.3936	39.28	5	1.43207	101.16	13.3
13	78.3046	0.48	54.46	3	1.22002	85.09	11.18

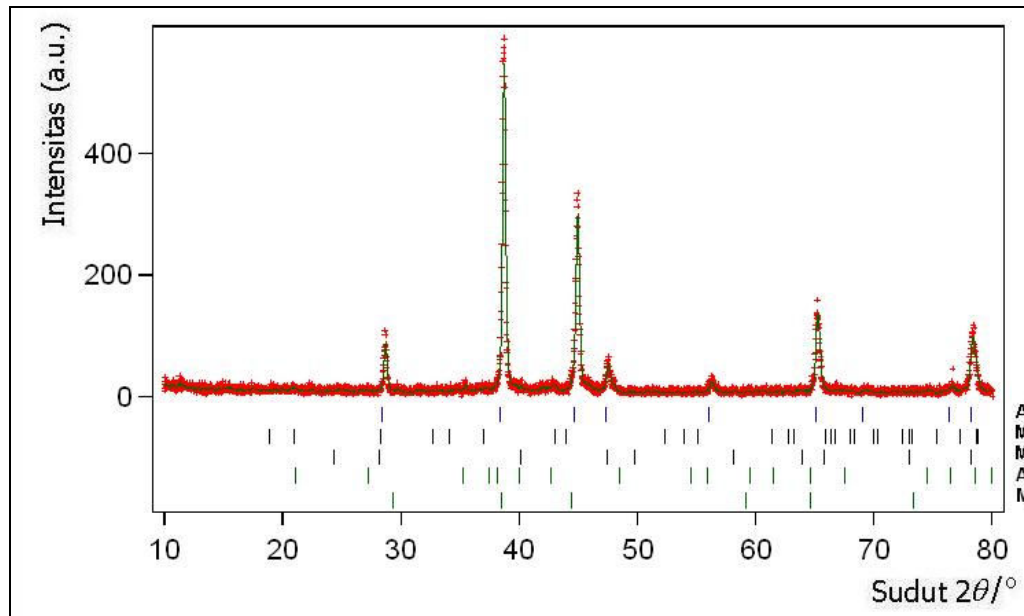
Profil difraksi sinar-x sampel 4
x-ray diffraction profile sample 4



Analisis peaks sample 4
Peaks analysis sample 4

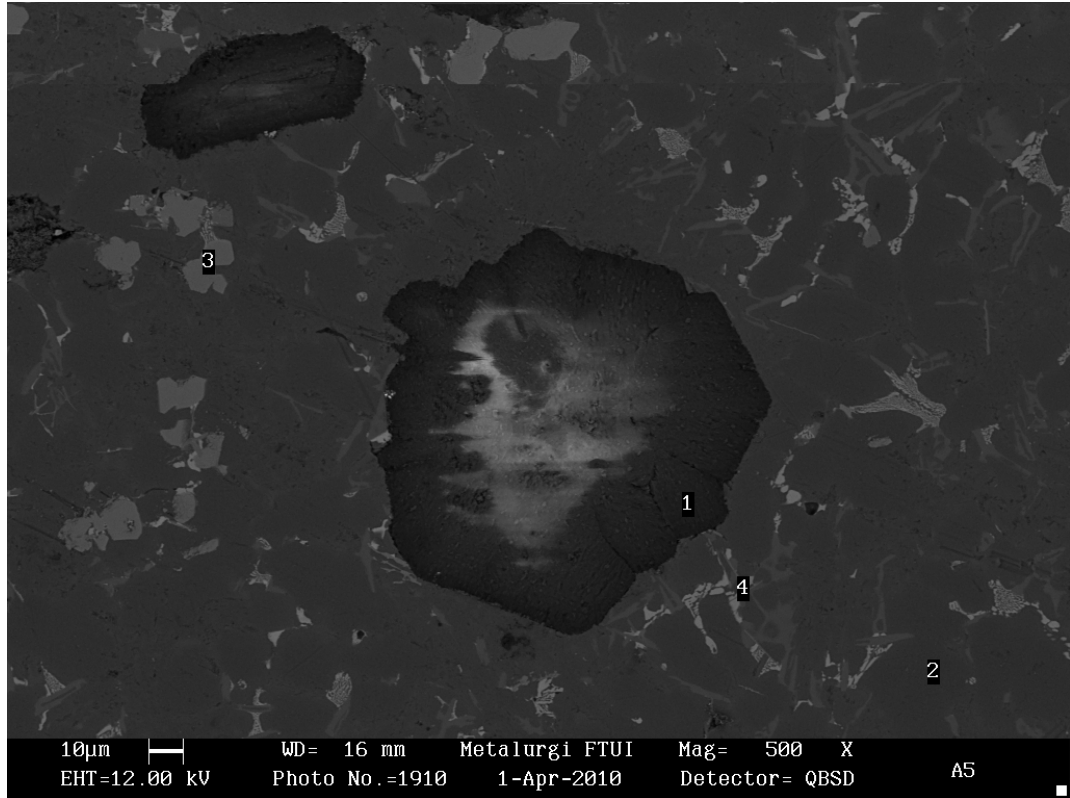
No.	Pos. [°2 θ .]	FWHM [°2 θ .]	Area [cts*°2 θ .]	Backgr.[cts]	d-spacing [Å]	Height [cts]	Rel. Int. [%]
1	20.6066	0.4723	3.75	9	4.31032	8.04	1.29
2	28.4575	0.2362	21.15	8	3.13652	90.77	14.57
3	35.1793	0.2362	4.56	8	2.5511	19.57	3.14
4	38.4546	0.2755	157.88	9	2.34102	580.91	93.24
5	44.6946	0.2362	145.14	9	2.02761	623.02	100
6	45.6019	0.3149	6.2	8	1.98936	19.97	3.21
7	47.3054	0.1968	9.59	8	1.92162	49.38	7.93
8	56.148	0.2362	4.84	5.1	1.63816	20.78	3.34
9	65.0373	0.2755	30.94	6	1.4341	113.84	18.27
10	69.282	0.6298	3.77	6	1.35625	6.08	0.98
11	76.2071	0.9446	3.06	8	1.24932	3.28	0.53
12	78.1976	0.576	50.02	10	1.22142	65.13	10.45

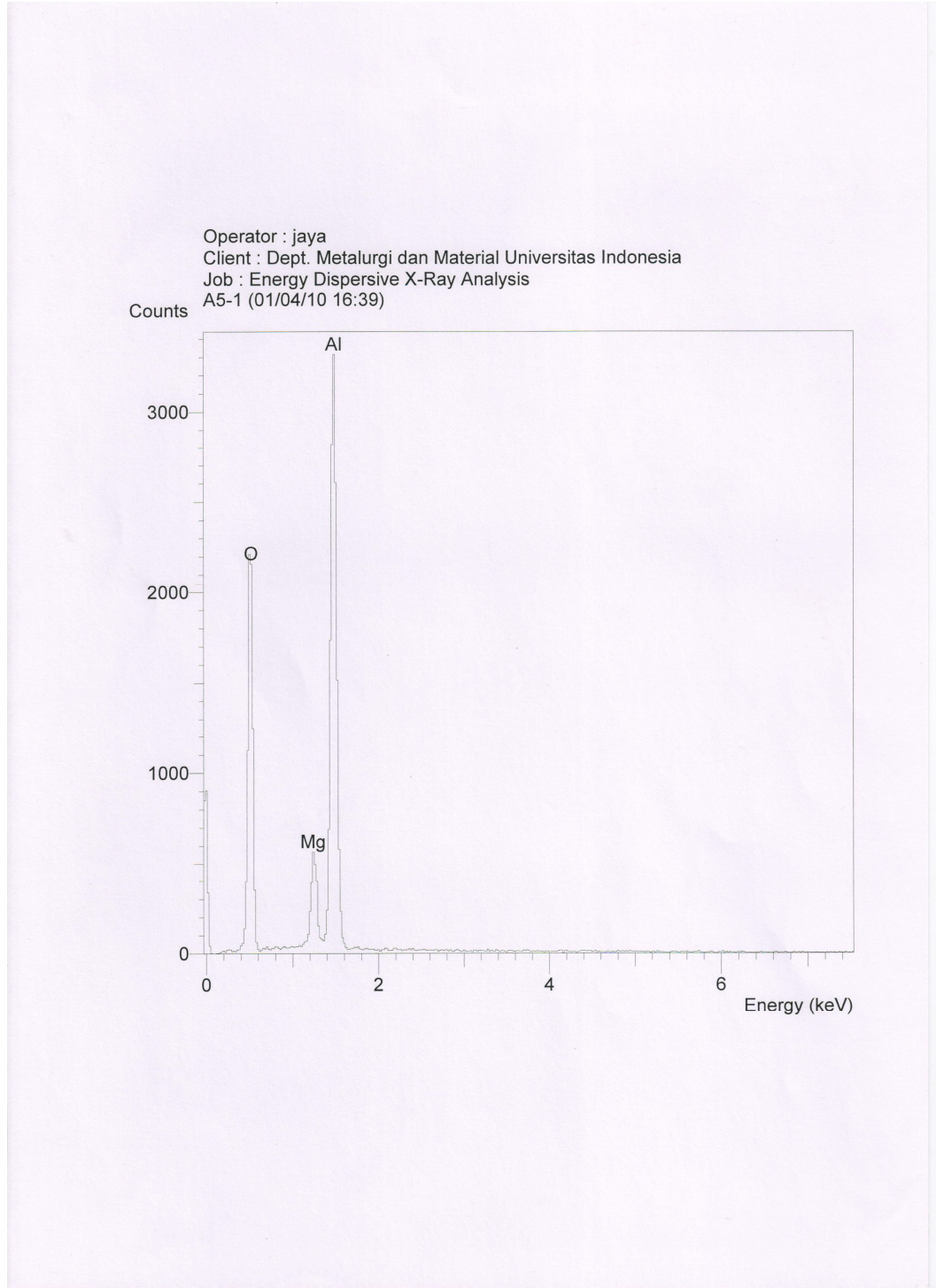
Profil difraksi sinar-x sampel 5
x-ray diffraction profile sample 5



Analisis peaks sample 5
Peaks analysis sample 5

No.	Pos. [°2 θ .]	FWHM [°2 θ .]	Area [cts*°2 θ .]	Backgr.[cts]	d-spacing [Å]	Height [cts]	Rel. Int. [%]
1	28.6551	0.2755	24.47	7	3.11534	90.03	16.04
2	35.4081	0.2362	2.58	9	2.53514	11.07	1.97
3	38.7018	0.2755	152.59	9	2.32664	561.44	100
4	42.9457	0.4723	4.7	9	2.10604	10.08	1.8
5	44.9218	0.3149	97.04	8	2.01788	312.41	55.64
6	47.4873	0.2755	12.94	7	1.91468	47.61	8.48
7	56.2583	0.3936	7.41	6	1.63521	19.08	3.4
8	65.1623	0.3149	40.76	7	1.43166	131.21	23.37
9	69.2547	0.6298	3.18	7	1.35672	5.12	0.91
10	78.329	0.336	39.92	9	1.2197	89.11	15.87





Operator : jaya
Client : Dept. Metalurgi dan Material Universitas Indonesia
Job : Energy Dispersive X-Ray Analysis
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