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LAMPIRAN

LAMPIRAN A

HASIL ANALISIS X-RAY DIFFRACTION ZEOLIT

Match! Phase Analysis Report

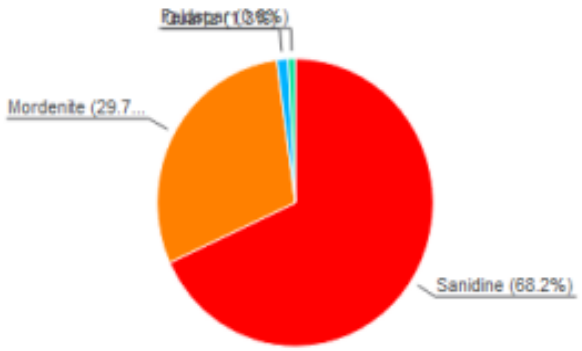
Sample: ZT-MCL (5-70)

Sample Data

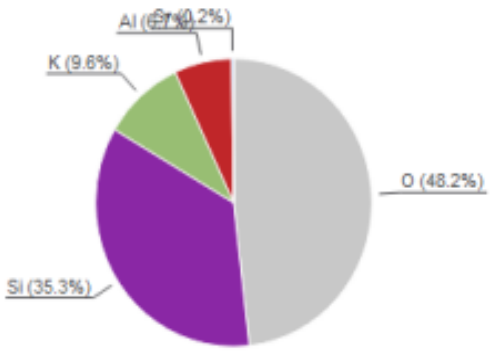
File name	ZT-MCL.RAW
File path	C:/Users/Zahran/Downloads
Data collected	Oct 13, 2022 14:47:00
Data range	5.000° - 70.000°
Original data range	5.000° - 70.000°
Number of points	3251
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

Analysis Results

Phase composition



Elemental composition



Index	*Amount (%)*	*Name*	*Formula sum*
A	68.2	Sanidine	Al K O8 Si3
B	29.7	Mordenite	O96 Si48
C	1.3	Quartz	O2 Si
D	0.8	Feldspar	Al2 O8 Si2 Sr
	11.5	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	48.2%(*)
Si	35.3%
K	9.6%
Al	6.7%
Sr	0.2%
**LE (sum)*	*48.2%*

Details of identified phases

A: Sanidine (68.2 %)*

Formula sum	Al K O8 Si3
Entry number	96-900-4245
Figure-of-Merit (FoM)	0.787497*
Total number of peaks	292
Peaks in range	161
Peaks matched	97
Intensity scale factor	0.75*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 8.6030 Å b= 13.0360 Å c= 7.1740 Å β= 116.030 °
I/Ic	0.74
Calc. density	2.557 g/cm³
Reference	Ferguson R. B., Ball N. A., Cerny P., "Structure refinement of an adularian end-member high sanidine from theBuck Claim Pegmatite, Bernic Lake, ManitobaSample: ILocality: Buck Claim Pegmatite, Bernic Lake, Manitoba, CanadaNote: variety adularia", The Canadian Mineralogist **29**, 543-552 (1991)

B: Mordenite (29.7 %)

Formula sum	O96 Si48
Entry number	96-230-0646
Figure-of-Merit (FoM)	0.000000
Total number of peaks	300
Peaks in range	300
Peaks matched	156
Intensity scale factor	1.00
Space group	C m c m
Crystal system	orthorhombic
Unit cell	a= 18.1100 Å b= 20.5300 Å c= 7.5280 Å
I/Ic	2.25
Calc. density	1.793 g/cm³
Reference	Cichocka Magdalena Ola, \%Angström Jonas, Wang Bin, Zou Xiaodong, Smeets Stef, "High-throughput continuous rotation electron diffraction data acquisitionvia software automation", Journal of Applied Crystallography **51(6)** (2018)

C: Quartz (1.3 %)*

Formula sum	O2 Si
Entry number	96-901-1496
Figure-of-Merit (FoM)	0.644501*
Total number of peaks	64
Peaks in range	14
Peaks matched	8
Intensity scale factor	0.06*
Space group	P 31 2 1 S
Crystal system	trigonal (hexagonal axes)
Unit cell	a= 4.6764 Å c= 5.2475 Å
I/Ic	2.81
Calc. density	3.012 g/cm³
Reference	Glinnemann J., King H. E., Schulz H., Hahn T., La Placa S. J., Dacol F., "Crystal structures of the low-temperature quartz-type phases of SiO2 and GeO2at elevated pressure P = 7.2GPa = 72 kbar", Zeitschrift fur Kristallographie **198**, 177-212 (1992)

D: Feldspar (0.8 %)*

Formula sum	Al2 O8 Si2 Sr
Entry number	96-900-0434
Figure-of-Merit (FoM)	0.713179*
Total number of peaks	288
Peaks in range	283
Peaks matched	162
Intensity scale factor	0.01*
Space group	I 1 2/c 1
Crystal system	monoclinic
Unit cell	a= 8.3880 Å b= 12.9740 Å c= 14.2640 Å β= 115.200 °
I/Ic	1.17
Calc. density	3.081 g/cm³
Reference	Chiari G., Calleri M., Bruno E., Ribbe P. H., "The structure of partially disordered, synthetic strontium feldspar", American Mineralogist **60**, 111-119 (1975)

(*) 2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Candidates

Name	*Formula*	*Entry No.*	*FoM*
Ammonium chloride - $-beta (Salammoniac)	Cl H4 N	96-101-1131	0.6866
	Au2 In Ti	96-151-0433	0.6752
	Dy Pd Sb	96-152-7757	0.6752
	Pt2 Sc Sn	96-152-3490	0.6680
Dilithium telluride	Li2 Te	96-101-0876	0.6527
	Li2 Te	96-900-9063	0.6527
	Ni Sn Th	96-152-3358	0.6523
	Ni Sn Th	96-153-8961	0.6523
Potassium cyanide	C K N	96-591-0130	0.6449
Disodium sulfide	Na2 S	96-101-1375	0.6448
	Na2 S	96-900-9065	0.6448
Miersite	Ag I	96-901-1694	0.6383
Ba Te O3	Ba O3 Te	96-152-4716	0.6367
Ba2 P Cl	Ba2 Cl P	96-154-1842	0.6364
	Pt Sb Y	96-153-7832	0.6355
	Mg8 Si2.404 Sn1.596	96-153-8758	0.6345
Dimagnesium nickel tetradeuteride	D4 Mg2 Ni	96-100-8844	0.6341
Magnesium nickel deuteride (2/1/4)	D4 Mg2 Ni	96-100-8290	0.6336
Au2 (Cd In2 Sn)	Au2 Cd In2 Sn	96-151-0375	0.6334
Magnesium nickel deuteride (2/1/4)	D4 Mg2 Ni	96-100-8289	0.6333
	Au Mg	96-151-0231	0.6332
	Pt Sc	96-153-7629	0.6316
	B H4 Li	96-150-4404	0.6279

Mg2 Ni H4	H4 Mg2 Ni	96-152-1146	0.6207
K (C N)	C K	96-153-7185	0.6207
	Na2 S	96-434-4367	0.6198
	Ni Sn Th	96-153-8068	0.6182
Au (Cd Sn)	Au Cd Sn	96-151-0081	0.6180
	Pt Sc	96-152-3663	0.6179
	Ag2 Al Sc	96-150-9643	0.6157
	Au In2	96-900-9002	0.6154
Lithium antimonide	Li3 Sb	96-101-1381	0.6135
Heterogenite	Co H O2	96-900-9450	0.6092
(Cd Mg) Te2	Cd Mg Te2	96-152-8172	0.6082
	Al6 Ca4 Cr O16	96-900-4875	0.6073
	Al6 Ca4 Cr O16	96-900-4869	0.6072
	Al6 Ca4 Cr O16	96-900-4876	0.6072
	Al6 Ca4 Cr O16	96-900-4874	0.6070
	Al6 Ca4 Cr O16	96-900-4870	0.6068
	Al6 Ca4 Cr O16	96-900-4878	0.6068
	Al6 Ca4 Cr O16	96-900-4873	0.6066
	Al6 Ca4 Cr O16	96-900-4879	0.6066
	Al6 Ca4 Cr O16	96-900-4877	0.6065
	Hg Li3	96-153-9518	0.6063
	Al6 Ca4 Cr O16	96-900-4872	0.6059
	Al6 Ca4 Cr O16	96-900-4880	0.6052
Strontium	Sr	96-900-8516	0.6014
Xenon	Xe	96-901-2454	0.5953
Xenon	Xe	96-901-2455	0.5951
Xenon	Xe	96-901-2456	0.5947
Xenon	Xe	96-901-2453	0.5943
	Al Sb	96-900-8833	0.5932

and 421 others...

Search-Match

Settings

Reference database used	COD-Inorg 2021.12.14
Automatic zeropoint adaptation	Yes
Downgrade entries with low scaling factors	Yes
Minimum figure-of-merit (FoM)	0.50
2theta window for peak corr.	0.30 deg.
Minimum rel. int. for peak corr.	0
Parameter/influence 2theta	0.50
Parameter/influence intensities	0.50
Parameter multiple/single phase(s)	0.50

Criteria for entries added by user

Reference:

Entry number:

96-155-2091;96-230-0645;96-230-0646;96-900-3355;96-900-3356;96-900-5243;96-900-5606;96-900-5607;96-900-5608;96-900-5609;96-901-0724;96-101-1256;96-720-3916;96-900-0364;96-900-0365;96-900-0366;96-900-0367;96-900-3630;96-900-3631;96-900-3632;96-900-3633;96-900-3634;96-900-3635;96-900-3884;96-900-3885;96-900-3886;96-900-3887;96-900-5047;96-900-5048;96-900-5049;96-900-5055;96-900-5056;96-900-5057;96-900-5058;96-900-5118;96-900-5245;96-900-5269;96-900-5708;96-900-6170;96-900-9400;96-900-9401;96-900-9402;96-901-0486;96-901-4770;96-101-1098;96-101-1160;96-101-1173;96-101-1177;96-101-1201;96-110-0020;96-500-0036;96-900-0776;96-900-0777;96-900-0778;96-900-0779;96-900-0780;96-900-0781;96-900-5018;96-900-5019;96-900-5020;96-900-5021;96-900-5022;96-900-5023;96-900-5024;96-900-5025;96-900-5026;96-900-5027;96-900-5028;96-900-5029;96-900-5030;96-900-5031;96-900-5032;96-900-5033;96-900-5034;96-900-7379;96-900-8093;96-900-8094;96-900-9667;96-901-0145;96-901-0146;96-901-0147;96-901-1494;96-901-1495;96-901-1496;96-901-1497;96-901-2601;96-901-2602;96-901-2603;96-901-2604;96-901-2605;96-901-2606;96-901-3322;96-901-5023

Peak List

No.	*2theta [°]*	*d [Å]*	*I/I0 (peak height)*	*Counts (peak area)*	*FWHM*	*Matched*
1	6.46	13.6713	69.48	17.36	0.6959	B
2	8.62	10.2498	21.88	5.00	0.6359	B
3	13.60	6.5057	56.23	5.17	0.2560	A,B,D
4	15.18	5.8319	36.36	3.76	0.2877	A,B,D
5	19.96	4.4448	333.36	73.74	0.6162	B
6	21.02	4.2230	514.14	81.22	0.4400	A,B,D
7	21.88	4.0589	96.80	14.50	0.4171	C,D
8	22.54	3.9415	178.90	25.32	0.3943	A,D
9	23.52	3.7795	729.49	91.29	0.3486	A,B,D
10	24.56	3.6217	171.71	23.83	0.3865	A,B,D
11	25.16	3.5367	183.77	26.75	0.4054	A,B
12	25.82	3.4478	444.71	57.48	0.3600	A,B,D
13	26.80	3.3239	1000.00	152.36	0.4244	A
14	27.24	3.2712	662.99	304.67	1.2800	A,B,D
15	27.68	3.2202	797.11	114.47	0.4000	A,B,C,D
16	29.16	3.0600	109.20	7.06	0.1800	B,D

17	29.84	2.9918	538.54	55.56	0.2873	A,B,D
18	30.80	2.9007	253.59	39.83	0.4375	A,B,D
19	32.40	2.7610	196.06	17.28	0.2455	A,B,D
20	33.56	2.6682	0.08	0.01	0.1800	D
21	34.80	2.5759	409.65	80.24	0.5456	A,B,D
22	35.20	2.5475	251.08	49.18	0.5456	A,B,D
23	37.14	2.4188	129.41	25.35	0.5456	A,B,D
24	37.64	2.3878	131.07	25.68	0.5456	A
25	38.92	2.3122	96.73	18.95	0.5456	A,B,D
26	39.66	2.2707	45.60	8.93	0.5456	A,B,D
27	40.78	2.2109	64.62	12.66	0.5456	A,B,C,D
28	41.64	2.1672	226.02	44.27	0.5456	A,B,D
29	42.56	2.1225	126.52	24.78	0.5456	A,B,C,D
30	43.86	2.0625	64.28	12.59	0.5456	A,B,D
31	45.12	2.0078	118.50	23.21	0.5456	A,B,D
32	46.04	1.9698	112.63	22.06	0.5456	A,B,D
33	47.16	1.9256	108.35	21.22	0.5456	A,B,D
34	47.54	1.9111	42.31	8.29	0.5456	A,B,D
35	48.14	1.8887	30.78	6.03	0.5456	A,B,C,D
36	49.26	1.8483	63.90	12.52	0.5456	A,B,D
37	50.90	1.7925	235.40	45.41	0.5373	A,B,D
38	52.34	1.7466	34.61	6.68	0.5373	A,B,C,D
39	54.12	1.6933	45.67	13.87	0.7609	A,B,D
40	54.84	1.6727	85.35	30.17	0.9845	A,B,D
41	55.62	1.6511	61.56	24.20	0.9845	A,B,D
42	56.28	1.6333	72.54	28.51	0.9845	A,B,D
43	58.12	1.5859	32.99	12.97	0.9845	A,B,D
44	59.24	1.5585	40.47	15.91	0.9845	A,B,D
45	60.22	1.5355	56.13	22.06	0.9845	A,B,C,D
46	61.92	1.4974	146.91	57.74	0.9845	A,B,D
47	63.70	1.4597	38.08	14.97	0.9845	A,B,D
48	64.74	1.4388	73.77	29.00	0.9845	A,B,D
49	66.32	1.4083	37.27	14.65	0.9845	A,D
50	67.70	1.3829	46.39	18.23	0.9845	A,D

Integrated Profile Areas

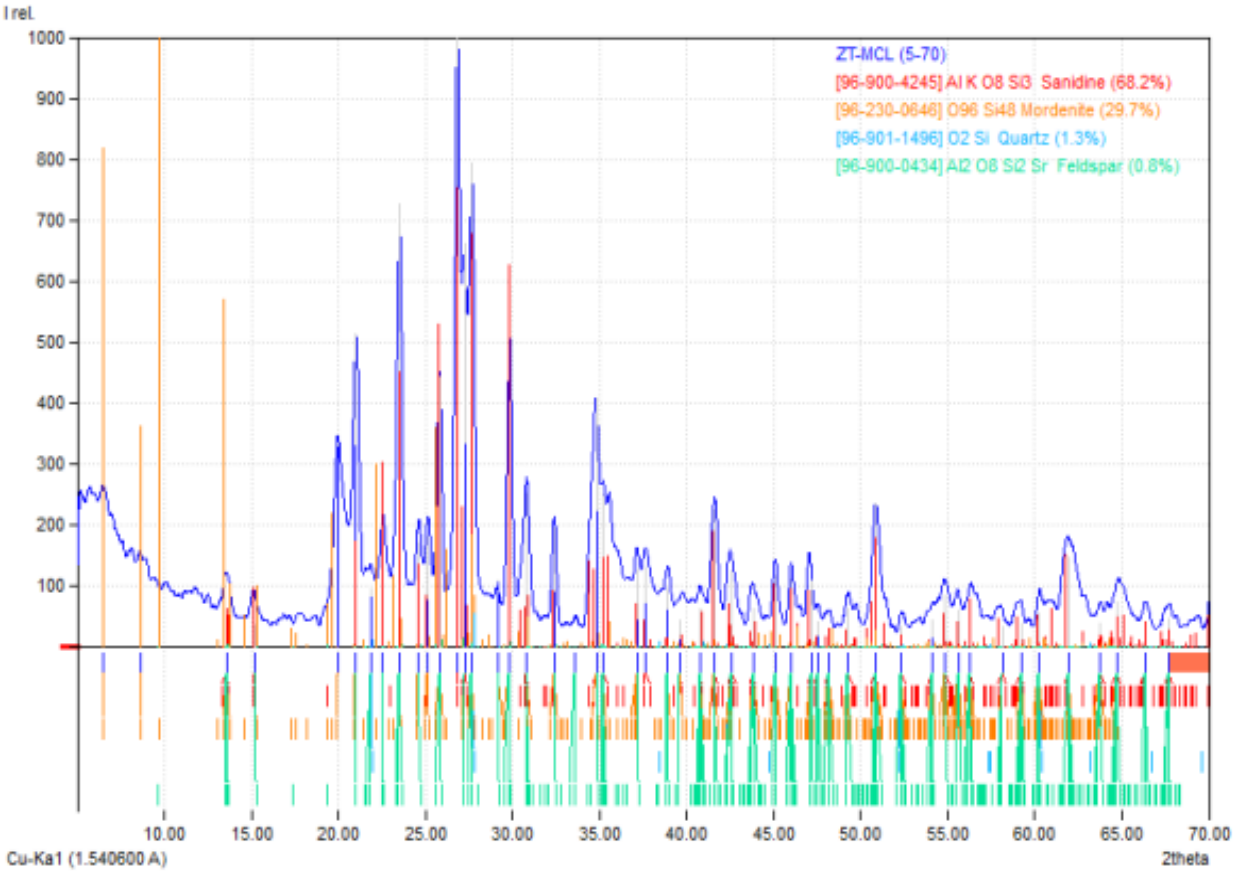
Based on calculated profile

Profile area	***Counts***	***Amount***
Overall diffraction profile	120255	100.00%
Background radiation	52899	43.99%
Diffraction peaks	67357	56.01%
Peak area belonging to selected phases	53475	44.47%
Peak area of phase A (Sanidine)	*40185*	*33.42%*
Peak area of phase B (Mordenite)	*11915*	*9.91%*
Peak area of phase C (Quartz)	*554*	*0.46%*
Peak area of phase D (Feldspar)	*820*	*0.68%*
Unidentified peak area	13882	11.54%

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	1847	100.00%
Peak intensity belonging to selected phases	1592	86.22%
Unidentified peak intensity	254	13.78%

Diffraction Pattern Graphics



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LAMPIRAN B

PERHITUNGAN HASIL UJI KUAT TEKAN BATUBATA

No	Kode	Suhu (°C)	Gaya (N)	Luas (m²)	Kuat Tekan (MPa)
1	A	400	45000	0.0064	7.03
2		500	50000	0.0064	7.81
3		600	55000	0.0064	8.59
4		700	60000	0.0064	9.38
5	B	400	40000	0.0064	6.25
6		500	45000	0.0064	7.03
7		600	50000	0.0064	7.81
8		700	55000	0.0064	8.59
9	C	400	35000	0.0064	5.47
10		500	40000	0.0064	6.25
11		600	45000	0.0064	7.03
12		700	50000	0.0064	7.81
13	D	400	30000	0.0064	4.69
14		500	35000	0.0064	5.47
15		600	40000	0.0064	6.25
16		700	45000	0.0064	7.03

= Tidak Memenuhi Standar Batubata SNI 15-2094-2000

PERHITUNGAN KUAT TEKAN BATUBATA

Rumus :

$$P = \frac{F}{A}$$

Dimana :

P= Kuat Tekan Bahan (N/m^2 atau Kgf/cm^2)

F= Beban Tekan Maksimum (Gaya Tekan), (Kgf atau N)

A= Luas Bidang Bahan (m^2)

1. Batubata Zeolit dengan 0% sekam padi

Batubata suhu (400°C) $= \frac{F}{A} = \frac{45000\ N}{0.0064\ m^2} = 7.03$ MPa

Batubata suhu (500°C) $= \frac{F}{A} = \frac{5000\ N}{0.0064\ m^2} = 7.81$ MPa

Batubata suhu (600°C) $= \frac{F}{A} = \frac{55000\ N}{0.0064\ m^2} = 8.54$ MPa

Batubata suhu (700°C) $= \frac{F}{A} = \frac{60000\ N}{0.0064\ m^2} = 9.38$ MPa

2. Batubata zeolit dengan 5% sekam padi

Batubata suhu (400°C) $= \frac{F}{A} = \frac{40000\ N}{0.0064\ m^2} = 6.25$ MPa

Batubata suhu (500°C) $= \frac{F}{A} = \frac{45000\ N}{0.0064\ m^2} = 7.03$ MPa

Batubata suhu (600°C) $= \frac{F}{A} = \frac{5000\ N}{0.0064\ m^2} = 7.81$ MPa

Batubata suhu (700°C) $= \frac{F}{A} = \frac{55000\ N}{0.0064\ m^2} = 8.59$ MPa

3. Batubata zeolit dengan 10% sekam padi

Batubata suhu (400°C) $= \frac{F}{A} = \frac{35000\ N}{0.0064\ m^2} = 5.47$ MPa

Batubata suhu (500°C) $= \frac{F}{A} = \frac{40000\ N}{0.0064\ m^2} = 6.25$ MPa

Batubata suhu (600°C) $= \frac{F}{A} = \frac{4500\ N}{0.0064\ m^2} = 7.03$ MPa

Batubata suhu (700°C) $= \frac{F}{A} = \frac{50000\ N}{0.0064\ m^2} = 7.81$ MPa

4. Batubata zeolit dengan 15% sekam padi

Batubata suhu (400°C) $= \frac{F}{A} = \frac{30000\ N}{0.0064\ m^2} = 4.69$ MPa

Batubata suhu (500°C) $= \frac{F}{A} = \frac{35000\ N}{0.0064\ m^2} = 5.47$ MPa

Batubata suhu (600°C) $= \frac{F}{A} = \frac{40000\ N}{0.0064\ m^2} = 6.25$ MPa

Batubata suhu (700°C) $= \frac{F}{A} = \frac{45000\ N}{0.0064\ m^2} = 7.03$ MPa

Berdasarkan hasil perhitungan, batubata kode D variasi campuran 15% sekam padi tidak memenuhi kualifikasi batubata yang sesuai dengan SNI 15-2049-2000 (kuat tekan dibawah 5 MPa).

LAMPIRAN C

HASIL HASIL UJI DAYA SERAP AIR

No	Kode	Suhu (°C)	W natural (g)	W jenuh (g)	Daya Serap Air
1	A1	400	645.2		0
2	A2	500	653.7		0
3	A3	600	660.6	730.3	10.55
4	A4	700	668.2	723.6	8.29
5	B1	400	630.3		0
6	B2	500	633.6		0
7	B3	600	639.1	720.2	12.69
8	B4	700	641.4	731.1	13.99
9	C1	400	624.1		0
10	C2	500	627.3		0
11	C3	600	635.2	728.5	14.69
12	C4	700	640.2	736.9	15.10
13	D1	400	620.3		0
14	D2	500	624.8		0
15	D3	600	632.5	732.6	15.83
16	D4	700	639.1	742.8	16.26

PERHITUNGAN DAYA SERAP AIR BATUBATA

Rumus :

$$\left(\frac{W\,jenuh - W\,natural}{W\,natural}\right) \text{ x } 100\%$$

Dimana :

W jenuh : Berat batubata setelah direndam (g)

W natural : Berat batubata sebelum direndam (g)

1. Batubata zeolit dengan 0% sekam padi

Batubata suhu 600°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right)$ x 100%

$= \left(\frac{730.3 - 660.6}{660.6}\right)$ x 100%

$= \left(\frac{69.7}{660.6}\right)$ x 100%

= 10.55%

Batubata suhu 700°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right)$ x 100%

$$= \left(\frac{723.6 - 668.2}{668.2}\right) \text{ x } 100\%$$

$$= \left(\frac{55.4}{668.2}\right) \text{ x } 100\%$$

$$= 8.29\%$$

2. Batubata zeolit dengan 5% sekam padi

Batubata suhu 600°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right) \text{ x } 100\%$

$$= \left(\frac{720.2 - 639.1}{639.1}\right) \text{ x } 100\%$$

$$= \left(\frac{81.1}{639.1}\right) \text{ x } 100\%$$

$$= 12.69\%$$

Batubata suhu 700°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right) \text{ x } 100\%$

$$= \left(\frac{731.1 - 641.4}{641.4}\right) \text{ x } 100\%$$

$$= \left(\frac{89.7}{641.4}\right) \text{ x } 100\%$$

$$= 13.99\%$$

3. Batubata zeolit dengam 10% sekam padi

Batubata suhu 600°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right) \text{ x } 100\%$

$$= \left(\frac{728.5 - 635.2}{640.2}\right) \text{ x } 100\%$$

$$= \left(\frac{93.3}{635.2}\right) \text{ x } 100\%$$

$$= 14.69\%$$

Batubata suhu 700°C $= \left(\frac{W\,jenuh - W\,natural}{W\,natural}\right) \text{ x } 100\%$

$$= \left(\frac{736.9 - 640.2}{640.2}\right) \text{ x } 100\%$$

$$= \left(\frac{96.7}{640.2}\right) \text{ x } 100\%$$

$$= 15.10\%$$

4. Batubata zeolit dengam 15% sekam padi

Batubata suhu 600°C = $\left(\frac{W\,jenuh - W\,natural}{W\,natural}\right)$ x 100%

= $\left(\frac{732.6 - 632.5}{632.5}\right)$ x 100%

= $\left(\frac{100.1}{635.2}\right)$ x 100%

= 15.83%

Batubata suhu 700°C = $\left(\frac{W\,jenuh - W\,natural}{W\,natural}\right)$ x 100%

= $\left(\frac{742.8 - 639.1}{639.1}\right)$ x 100%

= $\left(\frac{103.1}{639.1}\right)$ x 100%

= 16.23%

Berdasarkan hasil pengujian daya serap air menunjukkan bahwa batubata yang dibakar pada suhu 400°C dan 500°C pada setiap variasi campuran sekam padi hancur saat direndam dalam desitkator sehingga tidak diperoleh berat jenuh.

LAMPIRAN D

HASIL UJI DENSITAS BATUBATA

No	Kode	Suhu (°C)	Volume (cm^3)	W natural (g)	Densitas
1	A	400	384	645.2	1.68
2		500	384	653.7	1.70
3		600	384	660.6	1.72
4		700	384	668.2	1.74
5	B	400	384	630.3	1.64
6		500	384	633.6	1.65
7		600	384	639.1	1.66
8		700	384	641.4	1.67
9	C	400	384	624.1	1.63
10		500	384	627.3	1.63
11		600	384	635.2	1.65
12		700	384	640.2	1.67
13	D	400	384	620.3	1.62
14		500	384	624.8	1.63
15		600	384	632.5	1.65
16		700	384	639.1	1.66

PERHITUNGAN HASIL UJI DENSITAS BATUBATA

Rumus :

$$\rho = \frac{m}{v}$$

Keterangan :

ρ = Densitas Suatu Bahan (g/cm^3)

m = Massa Kering Bahan (g)

v = Volume Bahan (cm^3)

1. Batubata zeolit dengan 0% sekam padi

   Batubata suhu 400°C = $\frac{645.2\ gr}{384\ cm^3}$ = 1.68 g/cm^3

   Batubata suhu 500°C = $\frac{653.7\ gr}{384\ cm^3}$ = 1.70 g/cm^3

   Batubata suhu 600°C = $\frac{660.6 gr}{384\ cm^3}$ = 1.72 g/cm^3

   Batubata suhu 700°C = $\frac{668.2\ gr}{384\ cm^3}$ = 1.74 g/cm^3

2. Batubata zeolit dengan 5% sekam padi

Batubata suhu 400°C = $\frac{630.3\ gr}{384\ cm^3}$ = 1.64 g/cm^3

Batubata suhu 500°C = $\frac{633.6\ gr}{384\ cm^3}$ = 1.65 g/cm^3

Batubata suhu 600°C = $\frac{624.1 gr}{384\ cm^3}$ = 1.62 g/cm^3

Batubata suhu 700°C = $\frac{641.4\ gr}{384\ cm^3}$ = 1.67 g/cm^3

3. Batubata zeolit dengan 10% sekam padi

Batubata suhu 400°C = $\frac{624.1\ gr}{384\ cm^3}$ = 1.62 g/cm^3

Batubata suhu 500°C = $\frac{627.3\ gr}{384\ cm^3}$ = 1.63 g/cm^3

Batubata suhu 600°C = $\frac{635.2 gr}{384\ cm^3}$ = 1.65 g/cm^3

Batubata suhu 700°C = $\frac{640.2\ gr}{384\ cm^3}$ = 1.67 g/cm^3

4. Batubata zeolit dengan 15% sekam padi

Batubata suhu 400°C = $\frac{620.3 gr}{384\ cm^3}$ = 1.61 g/cm^3

Batubata suhu 500°C = $\frac{624.8\ gr}{384\ cm^3}$ = 1.63 g/cm^3

Batubata suhu 600°C = $\frac{632.5 gr}{384\ cm^3}$ = 1.65 g/cm^3

Batubata suhu 700°C = $\frac{639.1\ gr}{384\ cm^3}$ = 1.66 g/cm^3

Berdasarkan hasil pengujian densitas batubata menunjukkan bahwa batubata pada setiap variasi campuran sekam padi sesuai dengan standar batubata SNI 15-2049-2000.

LMPIRAN D

LEMBAR KONSULTASI TUGAS AKHIR

Lampiran B 10

Kartu Konsultasi Tugas Akhir

JUDUL: STUDI PEMANFAATAN ZEOLIT DENGAN CAMPURAN SEKAM PADI DALAM PEMBUATAN BATUBATA RAMAH LINGKUNGAN

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
29/08/2022	Abstrak Tujuan penelitian	
2/09/2022	Diagram alir penelitian grafik penelitian	
19/09/2022	Bab III Bab IV	
17/10/2022	Hasil analisis XRD —"— XRF	
7/11/2022	Bab V Abstrak Tujuan penelitian	
14/11/2022	Bab II	
18/11/2022	Bab IV	
30/11/2022	Bab I, II, III	
16/01/2023	Grafik penelitian (+) standar batubata di dalam grafik	

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