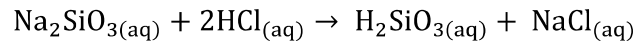
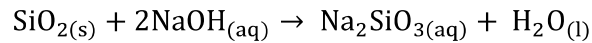




Appendix

A. Perhitungan massa abu sabut kelapa (SiO_2)



Basis $\text{H}_2\text{SiO}_3 = 20$ Gram

- Mol H_2SiO_3

$$\text{mol H}_2\text{SiO}_3 = \frac{\text{gr}}{\text{BM}} = \frac{20 \text{ gr}}{78,08 \text{ gr/mol}} = 0,2561 \text{ mol}$$

- Mol Na_2SiO_3

$$\text{mol Na}_2\text{SiO}_3 = \text{mol H}_2\text{SiO}_3$$

$$\frac{\text{gr}}{122,06} = \frac{20}{78,08}$$

$$\text{gr Na}_2\text{SiO}_3 = 31,2653 \text{ gram}$$

$$\text{mol Na}_2\text{SiO}_3 = \frac{\text{gr}}{\text{BM}} = \frac{31,2653 \text{ gr}}{122,06 \text{ gr/mol}} = 0,2561 \text{ mol}$$

| | Na₂SiO₃ | + 2HCl | → H₂SiO₃ | + NaCl |
|----------|--------------------------------------|---------------|---------------------------------------|---------------|
| m | 0,2561 | 2(0,2561) | | |
| r | 0,2561 | 0,2561 | 0,2561 | 0,2561 |
| s | 0 | 0,2561 | 0,2561 | 0,2561 |

- Mol SiO_2

$$\text{mol SiO}_2 = \text{mol Na}_2\text{SiO}_3$$

$$\frac{\text{gr}}{60,08} = \frac{31,2653}{122,06}$$

$$\text{gr SiO}_2 = 15,3895 \text{ gram}$$

$$\text{mol SiO}_2 = \frac{\text{gr}}{\text{BM}} = \frac{15,3895 \text{ gr}}{60,08 \text{ gr/mol}} = 0,2561 \text{ mol}$$



| | | | | | | | |
|----------|------------------------|----------|--------------|----------|--------------------------------------|----------|-----------------------|
| | SiO₂ | + | 2NaOH | → | Na₂SiO₃ | + | H₂O |
| m | 0,2561 | | 2(0,2561) | | | | |
| r | 0,2561 | | 0,2561 | | 0,2561 | | 0,2561 |
| s | 0 | | 0,2561 | | 0,2561 | | 0,2561 |

B. Pembuatan Larutan

1. Larutan HCl 1N 250 ml

$$N = \frac{\rho \times 10 \times \%}{BE} = \frac{1,19 \times 10 \times 32\%}{36,46/2} = 10,44 N$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$10,44 \times V_1 = 1 \times 250$$

$$V_1 = 23,94 \text{ ml}$$

2. Larutan HCl 3N 250 ml

$$N = \frac{\rho \times 10 \times \%}{BE} = \frac{1,19 \times 10 \times 32\%}{36,46/2} = 10,44 N$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$10,44 \times V_1 = 3 \times 250$$

$$V_1 = 71,84 \text{ ml}$$

3. Larutan NaOH 1,5N 500 ml

$$N = \frac{gr}{BE} \times \frac{1000}{ml}$$

$$1,5 = \frac{gr}{40} \times \frac{1000}{500}$$

$$gr = 20$$

4. Larutan NaOH 2N 500 ml

$$N = \frac{gr}{BE} \times \frac{1000}{ml}$$

$$2 = \frac{gr}{40} \times \frac{1000}{500}$$

$$gr = 40$$



5. Larutan NaOH 2,5N 500 ml

$$N = \frac{gr}{BE} \times \frac{1000}{ml}$$

$$1,5 = \frac{gr}{40} \times \frac{1000}{500}$$

$$gr = 20$$

6. Larutan NaOH 3N 500 ml

$$N = \frac{gr}{BE} \times \frac{1000}{ml}$$

$$1,5 = \frac{gr}{40} \times \frac{1000}{500}$$

$$gr = 20$$

7. Larutan NaOH 3,5N 500 ml

$$N = \frac{gr}{BE} \times \frac{1000}{ml}$$

$$1,5 = \frac{gr}{40} \times \frac{1000}{500}$$

$$gr = 20$$

C. Yield

$$Yield = \frac{Massa\ produk}{Massa\ bahan\ baku} \times 100\%$$

$$Yield = \frac{13,92}{15,4} \times 100\%$$

$$Yield = 90,39\%$$



Lampiran I



Sabut kelapa



Pencucian
sabut kelapa



Pengeringan
sabut kelapa



Pengabuan arang
sabut kelapa



Abu sabut
kelapa



Pencucian abu
dengan HCl



Pengeringan abu
yang telah dicuci



Penambahan abu
dengan pelarut
NaOH



Ekstraksi



Asidifikasi



Proses Aging



Penyaringan hasil aging



Pembilasan hasil aging dengan aquades



Pengeringan silika



Hasil produk silika xerogel sabut kelapa



Lampiran II

Hasil Analisa XRF

Sabut kelapa

16-mrt-2022 13:10:18

Sample results

Page 1

| Sample ident |
|--------------|
| E 243 |

| | |
|------------------|----------------------|
| Application | <Standardless> |
| Sequence | 1 of 1 |
| Measurement time | 16-mrt-2022 10:45:42 |
| Position | 9 |

| Compound | SiO2 | P2O5 | SO3 | K2O | CaO | Cr2O3 | MnO | Fe2O3 | NiO | CuO | ZnO | Yb2O3 |
|----------|------|------|-----|------|------|-------|------|-------|------|------|-----|-------|
| Conc | 4,7 | 4,4 | 6,6 | 31,7 | 44,0 | 1,2 | 0,29 | 4,66 | 0,54 | 0,63 | 0,3 | 0,4 |
| Unit | % | % | % | % | % | % | % | % | % | % | % | % |

| Compound | Re2O7 |
|----------|-------|
| Conc | 0,7 |
| Unit | % |

16-mrt-2022 11:35:26

Sample results

Page 1

| Sample ident |
|--------------|
| E 243 |

| | |
|------------------|----------------------|
| Application | <Standardless> |
| Sequence | 1 of 1 |
| Measurement time | 16-mrt-2022 10:45:42 |
| Position | 9 |

| Compound | Si | P | S | K | Ca | Cr | Mn | Fe | Ni | Cu | Zn | Yb | Re |
|----------|-----|-----|-----|------|------|-----|------|------|------|------|-----|-----|-----|
| Conc | 2,6 | 2,3 | 3,2 | 35,9 | 46,3 | 1,2 | 0,36 | 5,01 | 0,65 | 0,79 | 0,3 | 0,5 | 0,8 |
| Unit | % | % | % | % | % | % | % | % | % | % | % | % | % |



LAPORAN HASIL PENELITIAN

“Sintesis Silika Xerogel Dari Sabut Kelapa”

Abu sabut kelapa

2022- 6-21 11:23

| SQX Calculation Result | | | | | | | |
|-------------------------------|-----------|--------|-------|----------------------------------|----------|-----------|------------|
| Sample : 1575 ASK | | | | Date analyzed : 2022- 6-21 11:09 | | | |
| Application : B-U_Solid_N_001 | | | | Sample type : Oxide Powder | | | |
| Balance : | | | | | | | |
| Matching library : | | | | | | | |
| Sample film corr. : | | | | Impurity corr. : | | | |
| File : 1575 ASK | | | | | | | |
| No. | Component | Result | Unit | Det. limit | El. line | Intensity | w/o normal |
| 1 | Na2O | 1.95 | mass% | 0.01667 | Na-KA | 4.1120 | 1.5152 |
| 2 | MgO | 2.01 | mass% | 0.01214 | Mg-KA | 9.3641 | 1.5566 |
| 3 | Al2O3 | 2.00 | mass% | 0.00535 | Al-KA | 26.7121 | 1.5506 |
| 4 | SiO2 | 69.6 | mass% | 0.01335 | Si-KA | 843.5995 | 53.9363 |
| 5 | P2O5 | 4.10 | mass% | 0.00504 | P -KA | 70.5958 | 3.1755 |
| 6 | SO3 | 0.492 | mass% | 0.00282 | S -KA | 7.0222 | 0.3815 |
| 7 | Cl | 0.909 | mass% | 0.00511 | Cl-KA | 8.8794 | 0.7044 |
| 8 | K2O | 7.00 | mass% | 0.00910 | K -KA | 99.8997 | 5.4285 |
| 9 | CaO | 9.23 | mass% | 0.00688 | Ca-KA | 112.6242 | 7.1528 |
| 10 | V2O5 | 0.0222 | mass% | 0.00644 | V -KA | 0.1414 | 0.0172 |
| 11 | MnO | 0.0763 | mass% | 0.00294 | Mn-KA | 1.9152 | 0.0592 |
| 12 | Fe2O3 | 2.18 | mass% | 0.00251 | Fe-KA | 82.7598 | 1.6937 |
| 13 | CuO | 0.0764 | mass% | 0.00161 | Cu-KA | 8.6719 | 0.0592 |
| 14 | ZnO | 0.111 | mass% | 0.00143 | Zn-KA | 17.5179 | 0.0864 |
| 15 | Rb2O | 0.0292 | mass% | 0.00096 | Rb-KA | 16.1985 | 0.0226 |
| 16 | SrO | 0.0860 | mass% | 0.00098 | Sr-KA | 50.6509 | 0.0667 |
| 17 | SnO2 | 0.0312 | mass% | 0.00300 | Sn-KA | 0.5233 | 0.0242 |
| 18 | I | 0.0193 | mass% | 0.00594 | I -KA | 4.2101 | 0.0150 |
| 19 | BaO | 0.108 | mass% | 0.02322 | Ba-LA | 0.1853 | 0.0841 |



Hasil Analisa SAA

| No. | Hasil Uji | Metode/Instrumen |
|-----|--|---|
| 1. | Surface Area : 414,056 m ² /g | Surface Area & Pore Size Analyzer 1020/BLBC/K/MT |

Dikeluarkan di: Surabaya
Tanggal : 16 Juni 2022

Kepala Seksi Teknis Laboratorium,
Sutrisna
NIP. 19811018 200212 1 002

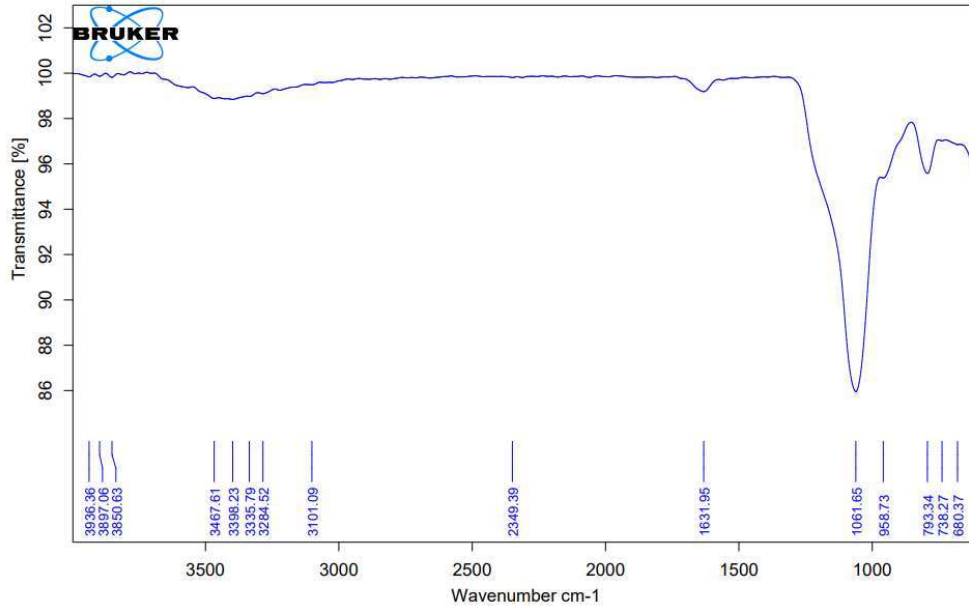
NB : Hasil analisa hanya berlaku untuk contoh yang diperiksa

Halaman 1 dari 1

No. Form : 19/BLBC/FRMT
Revisi : 02_18/02/2019



Hasil Analisa FTIR





Hasil Analisa XRD

Qualitative Analysis Results

| General information | | | |
|---------------------|------------------------------------|------------------|---------------------|
| Analysis date | 2022/06/21 10:46:42 | Measurement date | 2022/06/21 10:11:17 |
| Sample name | S-1575 2747 SX A | Operator | administrator |
| File name | S-1575 2747 SX A_Theta_2-Theta.raw | | |
| Comment | | | |

| Qualitative analysis results | | | | |
|--------------------------------|---------|-----------------|-------------------|----------------|
| S-1575 2747 SX A_Theta_2-Theta | | | | |
| Phase name | Formula | Figure of merit | Phase reg. detail | DB card number |

Phase data pattern

