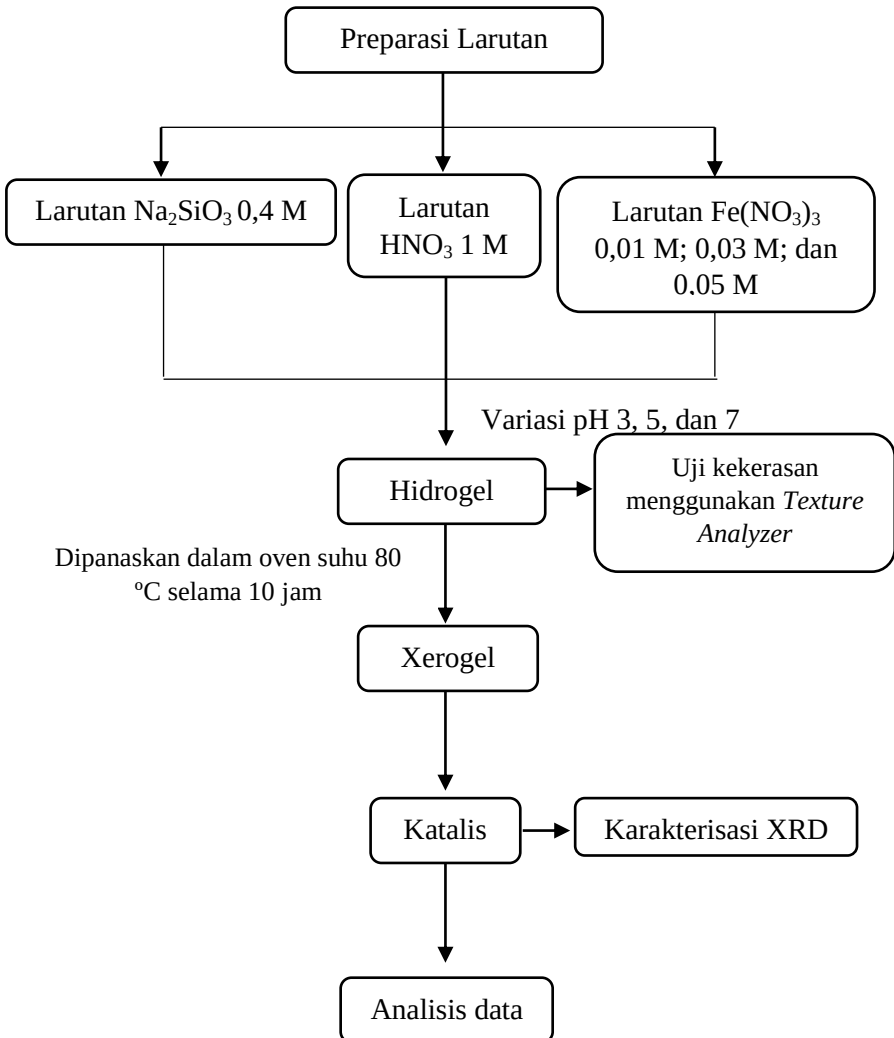


LAMPIRAN

LAMPIRAN A. Skema Kerja Umum



LAMPIRAN B. Preparasi Larutan

B.1 Preparasi Larutan Na_2SiO_3 0,4 M dalam 100 mL

Kadar SiO_2 dalam prekursor Na_2SiO_3 2,5 L = 25,5%

$$\text{Massa SiO}_2 \text{ dalam 2,5 L} = \frac{25,5 \text{ g}}{100 \text{ mL}} \times 2500 \text{ mL} = 637,5 \text{ g}$$

$$\text{Mol SiO}_2 = 637,5 \text{ g} \times \frac{1 \text{ mol}}{60,09 \text{ g}} = 10,60 \text{ mol}$$

$$[\text{SiO}_2] = \frac{10,60 \text{ mol}}{2,5 \text{ L}} = 4,24 \text{ M}$$

Volume prekursor Na_2SiO_3 yang dibutuhkan untuk membuat 100 mL

$$0,4 \text{ M Na}_2\text{SiO}_3 = \frac{0,4 \text{ mmol}}{1 \text{ mL}} \times 100 \text{ mL} \times \frac{1 \text{ mL}}{4,24 \text{ mmol}} = 9,43 \text{ mL}$$

B.2 Preparasi Larutan $\text{Fe}(\text{NO}_3)_3$ dalam 50 mL

B.2.1 Preparasi Larutan $\text{Fe}(\text{NO}_3)_3$ 0,01 M

$$M = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$[\text{Fe}(\text{NO}_3)_3] = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$0,01 \text{ M} = \frac{n \text{ (mol)}}{0,05 \text{ (L)}}$$

$$n = 0,0005 \text{ mol}$$

$$n \text{ (mol)} = \frac{\text{massa (g)}}{Mr \left(\frac{\text{g}}{\text{mol}} \right)}$$

$$0,0005 \text{ mol} = \frac{\text{massa (g)}}{241,86 \left(\frac{\text{g}}{\text{mol}} \right)}$$

$$\text{Massa} = 0,1 \text{ g}$$

B.2.2 Preparasi Larutan $\text{Fe}(\text{NO}_3)_3$ 0,03 M

$$M = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$[\text{Fe}(\text{NO}_3)_3] = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$0,03 \text{ M} = \frac{n \text{ (mol)}}{0,05 \text{ (L)}}$$

$$n = 0,0015 \text{ mol}$$

$$n \text{ (mol)} = \frac{\text{massa (g)}}{Mr \left(\frac{\text{g}}{\text{mol}} \right)}$$

$$0,0015 \text{ mol} = \frac{\text{massa (g)}}{241,86 \left(\frac{\text{g}}{\text{mol}}\right)}$$

$$\text{Massa} = 0,3 \text{ g}$$

B.2.3 Preparasi Larutan $\text{Fe}(\text{NO}_3)_3$ 0,05 M

$$M = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$[\text{Fe}(\text{NO}_3)_3] = \frac{n \text{ (mol)}}{V \text{ (L)}}$$

$$0,05 \text{ M} = \frac{n \text{ (mol)}}{0,05 \text{ (L)}}$$

$$n = 0,0025 \text{ mol}$$

$$n \text{ (mol)} = \frac{\text{massa (g)}}{Mr \left(\frac{\text{g}}{\text{mol}}\right)}$$

$$0,0025 \text{ mol} = \frac{\text{massa (g)}}{241,86 \left(\frac{\text{g}}{\text{mol}}\right)}$$

$$\text{Massa} = 0,6 \text{ g}$$

B.3 Preparasi Larutan HNO_3 1 M dalam 100 mL

$$\text{Kadar } \text{HNO}_3 = 65\%$$

$$\text{Berat Jenis} = 1,39 \text{ g/mL}$$

$$\text{Mr } \text{HNO}_3 = 63,012 \text{ g/mol}$$

$$[\text{HNO}_3] = \frac{\text{berat jenis} \left(\frac{\text{g}}{\text{mL}}\right)}{\text{Mr} \left(\frac{\text{g}}{\text{mol}}\right)} \times \frac{65}{100} \times \frac{1000 \text{ mL}}{1 \text{ L}}$$

$$= \frac{1,39 \left(\frac{\text{g}}{\text{mL}}\right)}{63,012 \left(\frac{\text{g}}{\text{mol}}\right)} \times \frac{65}{100} \times \frac{1000 \text{ mL}}{1 \text{ L}}$$

$$= 14,33 \text{ M}$$

- HNO_3 1 M

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 14,33 \text{ M} = 100 \text{ mL} \cdot 1 \text{ M}$$

$$V_1 = 6,97 \text{ mL}$$

Lampiran C. Data Pengukuran Tingkat Kekerasan Gel

TexturePro CT V1.4 Build 17

Brookfield Engineering Labs, Inc.

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 1	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:24:30 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	13.8 g
Deformation at Hardness:	10.00 mm
% Deformation at Hardness:	33.3 %
Hardness Work Cycle 1:	1.04 mJ
Recoverable Deformation Cycle 1:	7.50 mm
Recoverable Work Cycle 1:	-0.08 mJ
Total Work Cycle 1:	0.97 mJ
Adhesive Force:	1.1 g
Adhesiveness:	0.03 mJ
Resilience:	-0.07
Stringiness Length:	0.00 mm
Stringiness Work Done:	0.00 mJ
Hardness Cycle 2:	10.4 g
Hardness Work Cycle 2:	0.71 mJ
Recoverable Deformation Cycle 2:	-0.74 mm
Recoverable Work 2:	0.28 mJ
Total Work Cycle 2:	0.99 mJ

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 2	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:26:29 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	20.2 g
Deformation at Hardness:	2.33 mm
% Deformation at Hardness:	7.8 %
Hardness Work Cycle 1:	1.35 mJ
Recoverable Deformation Cycle 1:	2.08 mm
Recoverable Work Cycle 1:	0.07 mJ
Total Work Cycle 1:	1.42 mJ
Adhesive Force:	6.2 g
Adhesiveness:	0.18 mJ
Resilience:	0.05
Stringiness Length:	0.00 mm
Stringiness Work Done:	0.00 mJ
Hardness Cycle 2:	22.2 g
Hardness Work Cycle 2:	1.97 mJ
Recoverable Deformation Cycle 2:	5.08 mm
Recoverable Work 2:	-0.10 mJ
Total Work Cycle 2:	1.87 mJ

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 3	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:28:09 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	19.8 g
Deformation at Hardness:	10.00 mm
% Deformation at Hardness:	33.3 %
Hardness Work Cycle 1:	1.56 mJ
Recoverable Deformation Cycle 1:	7.37 mm
Recoverable Work Cycle 1:	-0.05 mJ
Total Work Cycle 1:	1.51 mJ
Adhesive Force:	3.1 g
Adhesiveness:	0.02 mJ
Resilience:	-0.03
Stringiness Length:	12.00 mm
Stringiness Work Done:	-0.04 mJ
Hardness Cycle 2:	24.0 g
Hardness Work Cycle 2:	1.52 mJ
Recoverable Deformation Cycle 2:	5.02 mm
Recoverable Work 2:	0.05 mJ
Total Work Cycle 2:	1.57 mJ

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 4	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:29:22 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	17.5 g
Deformation at Hardness:	5.01 mm
% Deformation at Hardness:	16.7 %
Hardness Work Cycle 1:	1.41 mJ
Recoverable Deformation Cycle 1:	7.44 mm
Recoverable Work Cycle 1:	-0.07 mJ
Total Work Cycle 1:	1.34 mJ
Adhesive Force:	7.7 g
Adhesiveness:	0.10 mJ
Resilience:	-0.05
Stringiness Length:	9.07 mm
Stringiness Work Done:	0.10 mJ
Hardness Cycle 2:	17.1 g
Hardness Work Cycle 2:	1.59 mJ
Recoverable Deformation Cycle 2:	5.07 mm
Recoverable Work 2:	-0.05 mJ
Total Work Cycle 2:	1.53 mJ

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 5	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:30:30 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	24.3 g
Deformation at Hardness:	10.00 mm
% Deformation at Hardness:	33.3 %
Hardness Work Cycle 1:	1.61 mJ
Recoverable Deformation Cycle 1:	5.03 mm
Recoverable Work Cycle 1:	0.15 mJ
Total Work Cycle 1:	1.76 mJ
Adhesive Force:	5.8 g
Adhesiveness:	0.18 mJ
Resilience:	0.10
Stringiness Length:	0.00 mm
Stringiness Work Done:	0.00 mJ
Hardness Cycle 2:	20.9 g
Hardness Work Cycle 2:	1.86 mJ
Recoverable Deformation Cycle 2:	5.02 mm
Recoverable Work 2:	-0.09 mJ
Total Work Cycle 2:	1.77 mJ

DATA REPORT

Sample Description	
Product Name: Hidrojel	Notes:
Batch Name: 6	
Sample: 1	
Dimensions:	
Shape: Cylinder	
Length: 30.00 mm	
Width: 10.00 mm	
Depth: 30.00 mm	
Test Method	
Test Date: 4/21/2017	Test Time: 1:31:38 PM
Test Type: Compression	Recovery Time: 0 s
Target: 10.0 mm	Same Trigger: False
Hold Time: 0 s	Pretest Speed: 2 mm/s
Trigger Load: 6.8 g	Data Rate: 4 points/sec
Test Speed: 10 mm/s	Probe: TA41
Return Speed: 10 mm/s	Fixture: TA-BT-KI
# of Cycles: 2	Load Cell: 1000g
Results	
Hardness Cycle 1:	29.4 g
Deformation at Hardness:	10.00 mm
% Deformation at Hardness:	33.3 %
Hardness Work Cycle 1:	2.34 mJ
Recoverable Deformation Cycle 1:	7.42 mm
Recoverable Work Cycle 1:	-0.18 mJ
Total Work Cycle 1:	2.16 mJ
Adhesive Force:	2.7 g
Adhesiveness:	0.04 mJ
Resilience:	-0.08
Stringiness Length:	8.77 mm
Stringiness Work Done:	0.04 mJ
Hardness Cycle 2:	24.8 g
Hardness Work Cycle 2:	1.88 mJ
Recoverable Deformation Cycle 2:	3.07 mm
Recoverable Work 2:	0.06 mJ
Total Work Cycle 2:	1.94 mJ

LAMPIRAN D. Data JCPDS Fe₂O₃

Joint Committee on Powder Diffraction Stndart (JCPDS) Data
No.13-534

CuK α_1 λ = 1.540598 Å; temp. 25 $\pm$ 1 °C Internal standard Ag, a = 4.08651 Å					
d(Å)	I ^{rel}	hkl			2 θ (°)
$\sigma = \pm 2$					
3.684	30	0	1	2	24.14
2.700	100	1	0	4	33.15
2.519	71	1	1	0	35.61
2.292	3	0	0	6	39.28
2.207	22	1	1	3	40.86
2.0779	3	2	0	2	43.52
1.8406	39	0	2	4	49.48
1.6941	47	1	1	6	54.09
1.6367	1	2	1	1	56.15
1.6033	5	1	2	2	57.43
1.5992	10	0	1	8	57.59
1.4859	30	2	1	4	62.45
1.4538	30	3	0	0	63.99
1.3497	3	2	0	8	69.60
1.3115	10	1	0	10	71.94
1.3064	6	1	1	9	72.26
1.2592	8	2	2	0	75.43
1.2276	4	3	0	6	77.73
1.2141	2	2	2	3	78.76
1.1896	5	1	2	8	80.71
1.1632	5	0	2	10	82.94
1.1411	7	1	3	4	84.92
1.1035	7	2	2	6	88.54
1.0768	2	0	4	2	91.35
1.0557	7	2	1	10	93.71

1.0428	1L	1	1	12	95.24
1.0393	3	4	0	4	95.66
.9892	4	3	1	8	102.29
.9715	1L	2	2	9	104.92
.9606	5	3	2	4	106.63
.9581	4	0	1	14	107.03
.9516	5	4	1	0	108.09
.9318	2	4	1	3	111.51
.9206	2	0	4	8	113.60
.9081	5	1	3	10	116.04
.8998	1	3	0	12	117.75
.8954	3	2	0	14	118.69
.8789	6	4	1	6	122.44
.8648	1	2	3	8	125.94
.8543	3	4	0	10	128.77
.8436	5	1	2	14	131.87
.8392	3	3	3	0	133.24
.8089	4	3	2	10	144.44
.8014	4	2	4	4	147.96