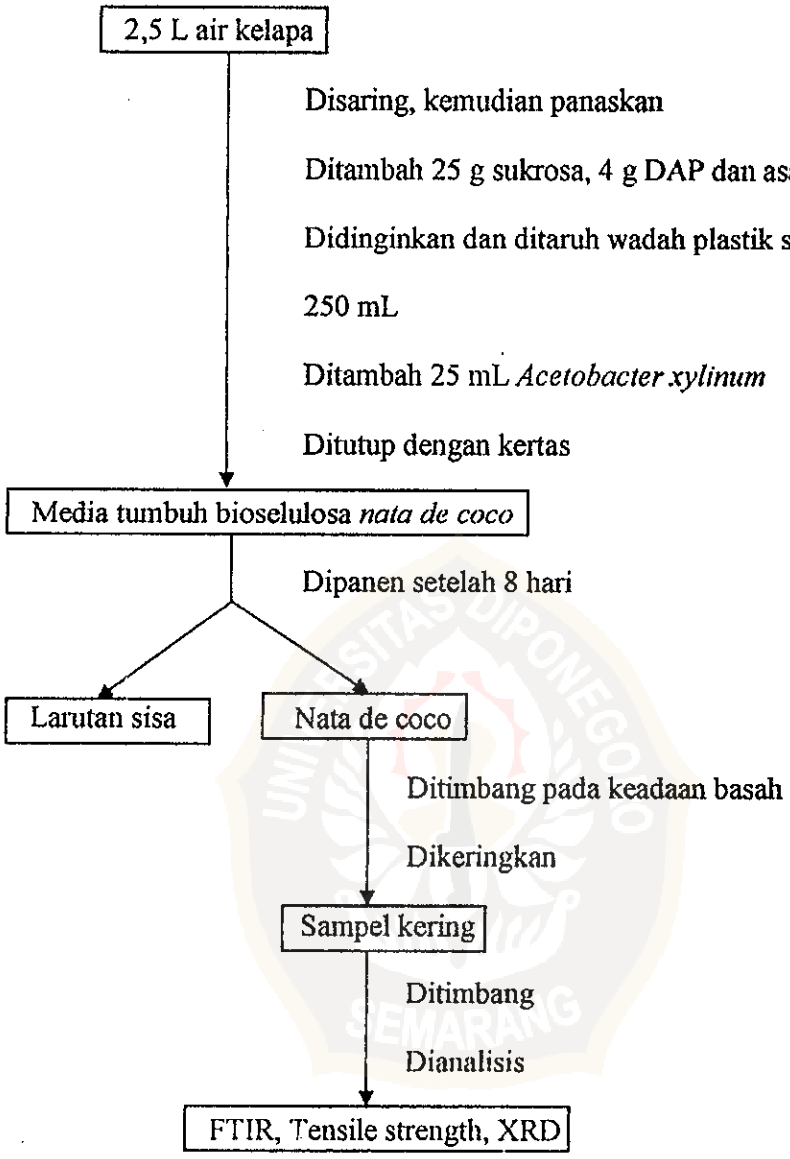
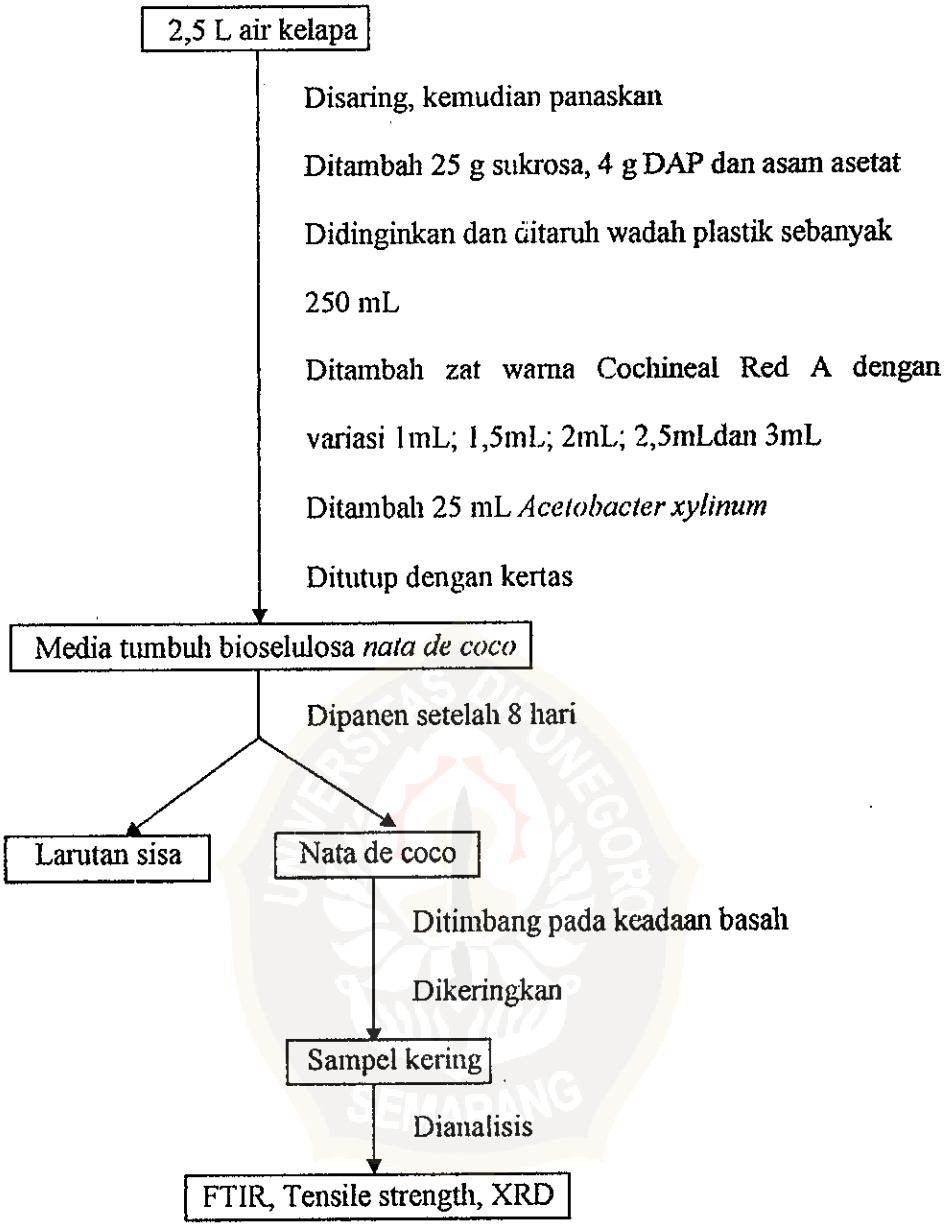
Lampiran A. Skema kerja pembuatan *nata de coco* dengan zat warna Cochineal Red A

Lampiran A.1 Pembuatan *nata de coco* tanpa zat warna

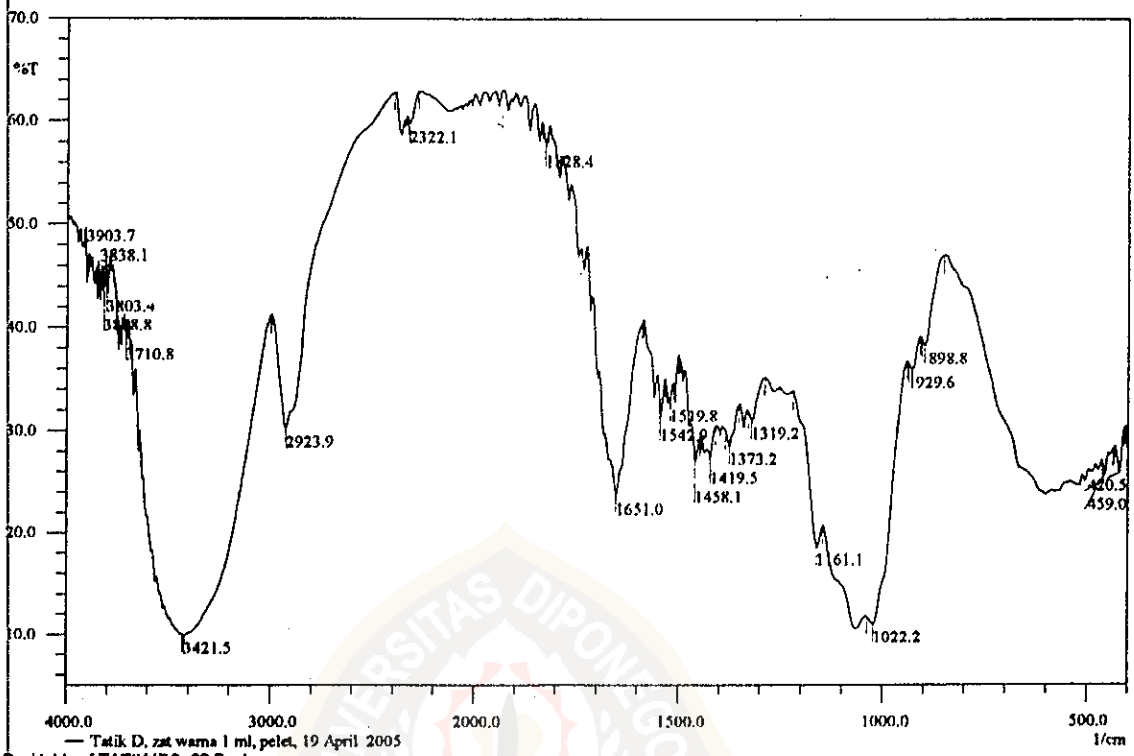


Lampiran A.2 Pembuatan *nata de coco* dengan zat warna *Cochineal Red A*



Lampiran B Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* dan Spektra IR *nata de coco* tanpa zat warna

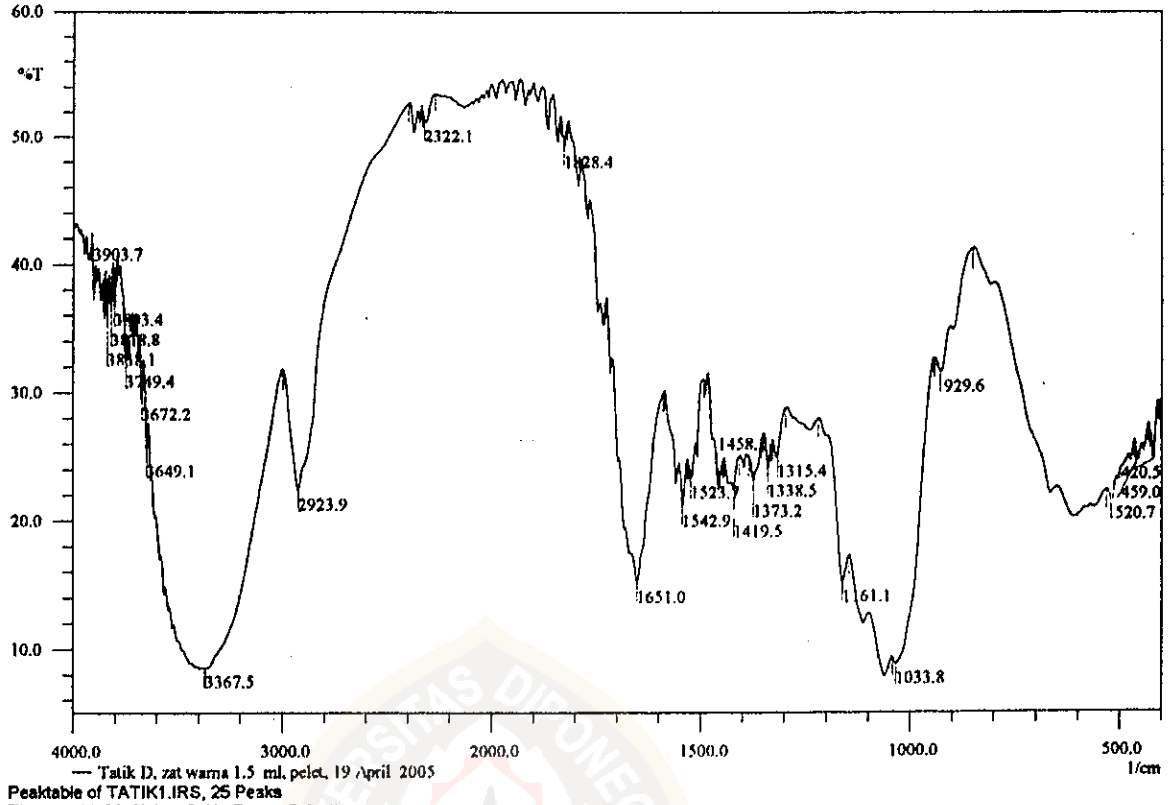
Gambar B.1 Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* 1 mL



Peaktable of TATIK.IRS, 22 Peaks
Threshhold: 80, Noise: 2, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	420.5	25.880
2	459.0	25.506
3	898.8	36.281
4	929.6	35.956
5	1022.2	10.986
6	1161.1	18.857
7	1319.2	31.023
8	1373.2	28.543
9	1419.5	27.446
10	1458.1	26.999
11	1519.8	32.731
12	1542.9	31.203
13	1651.0	23.613
14	1828.4	57.422
15	2322.1	59.718
16	2923.9	30.164
17	3421.5	9.930
18	3710.8	36.717
19	3803.4	43.363
20	3838.8	43.224
21	3838.1	42.692
22	3903.7	44.382

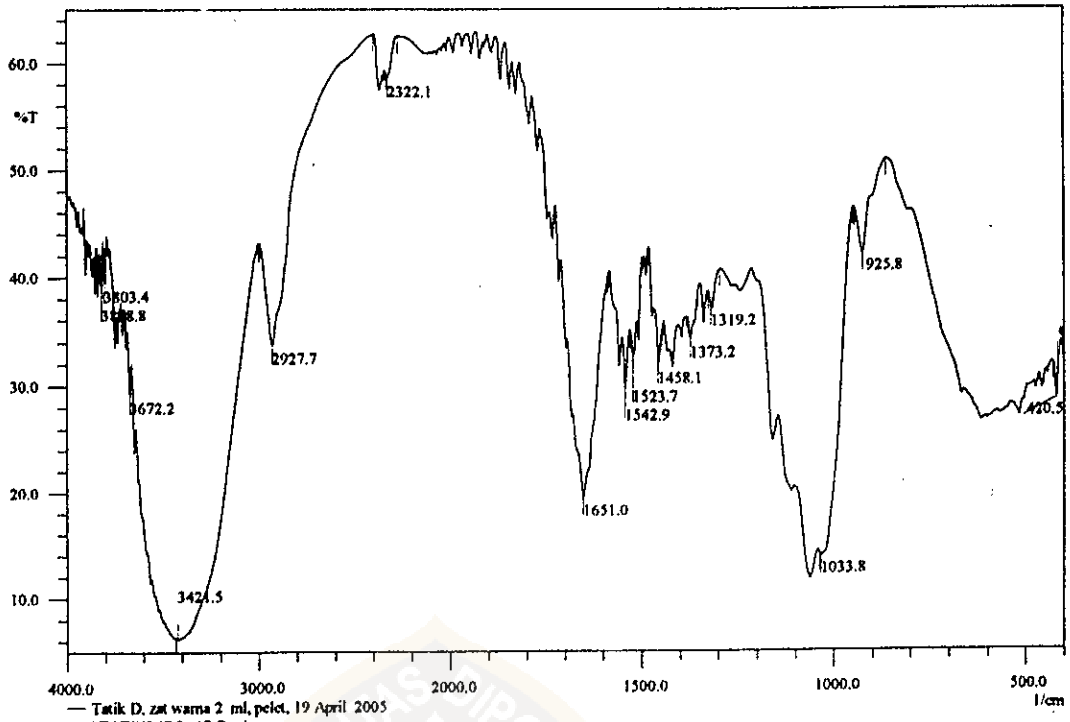
Gambar B.2 Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* 1,5 mL



Peaktable of TATIK1.IRS, 25 Peaks
Threshhold: 80, Noise: 2, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	420.5	24.701
2	459.0	24.670
3	520.7	21.631
4	929.6	31.589
5	1033.8	8.604
6	1161.1	15.166
7	1315.4	24.943
8	1338.5	24.037
9	1373.2	23.094
10	1419.5	22.411
11	1458.1	22.367
12	1523.7	23.281
13	1542.9	21.063
14	1651.0	15.132
15	1828.4	49.104
16	2322.1	51.160
17	2923.9	22.333
18	3367.5	8.536
19	3649.1	24.944
20	3672.2	29.428
21	3749.4	31.940
22	3803.4	36.794
23	3818.8	36.432
24	3838.1	35.708
25	3903.7	37.154

Gambar B.3 Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* 2 mL

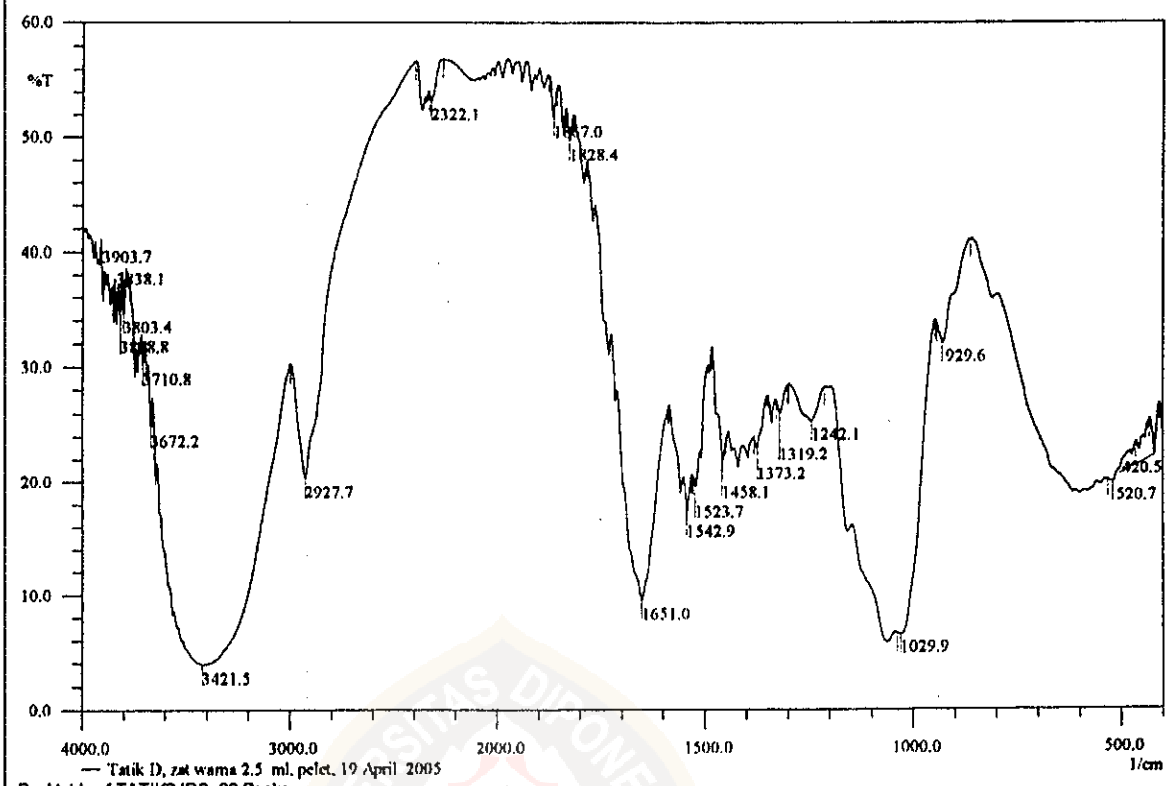


— Tatik D, zat warna 2 ml, pelet, 19 April 2005

Peaktable of TATIK2.IRS, 15 Peaks
Threshhold: 80, Noise: 3, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	420.5	28.863
2	925.8	42.165
3	1033.8	13.872
4	1319.2	37.064
5	1373.2	34.168
6	1458.1	31.807
7	1523.7	32.731
8	1542.9	29.542
9	1651.0	19.363
10	2322.1	58.469
11	2927.7	33.724
12	3421.5	6.232
13	3672.2	29.181
14	3803.4	39.446
15	3618.8	39.045

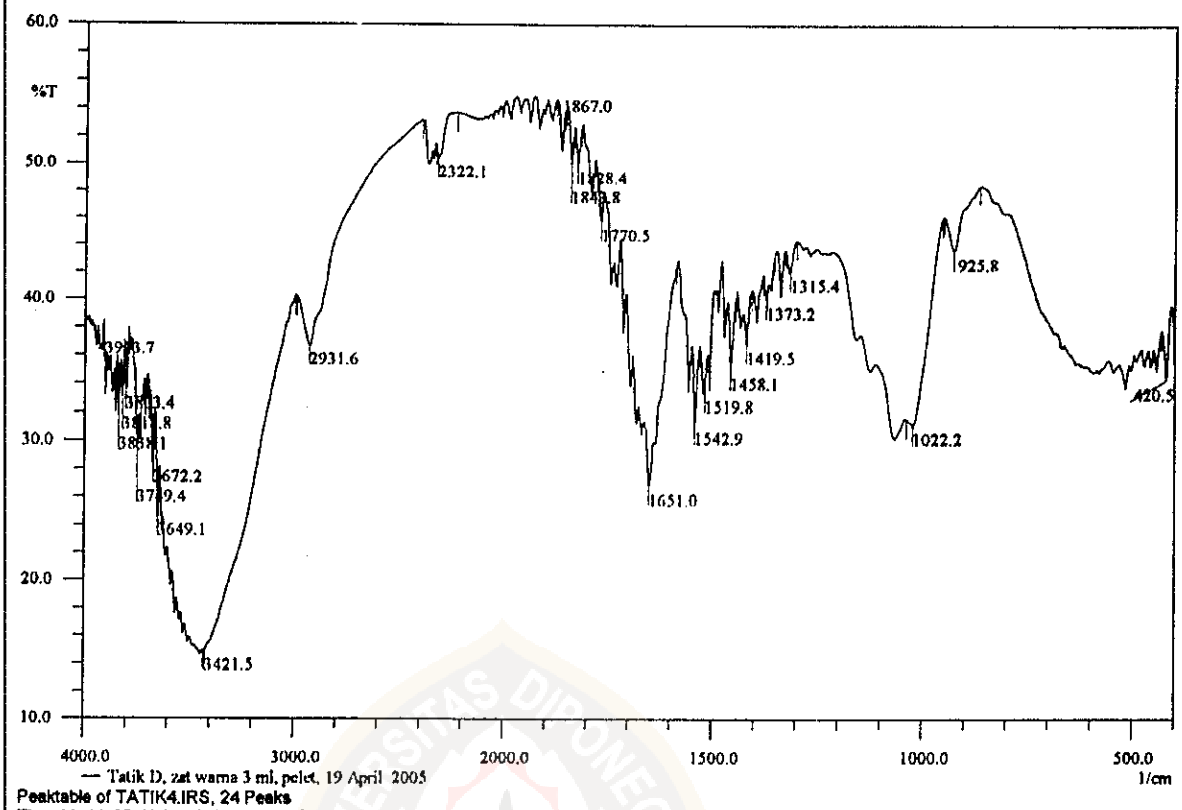
Gambar B.4 Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* 2,5 mL



Peaktable of TATIK3.IRS, 22 Peaks
Threshhold: 80, Noise: 2, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	420.5	22.344
2	520.7	19.908
3	929.6	32.070
4	1029.9	6.609
5	1242.1	25.367
6	1319.2	26.077
7	1373.2	23.019
8	1458.1	21.651
9	1523.7	19.549
10	1542.9	17.287
11	1651.0	9.536
12	1828.4	49.660
13	1837.0	51.692
14	2322.1	53.191
15	2927.7	20.296
16	3421.5	3.667
17	3672.2	24.832
18	3710.8	30.118
19	3803.4	34.637
20	3818.8	34.284
21	3838.1	33.678
22	3903.7	35.618

Gambar B.5 Spektra IR *nata de coco* dengan zat warna *Cochineal Red A* 3 mL

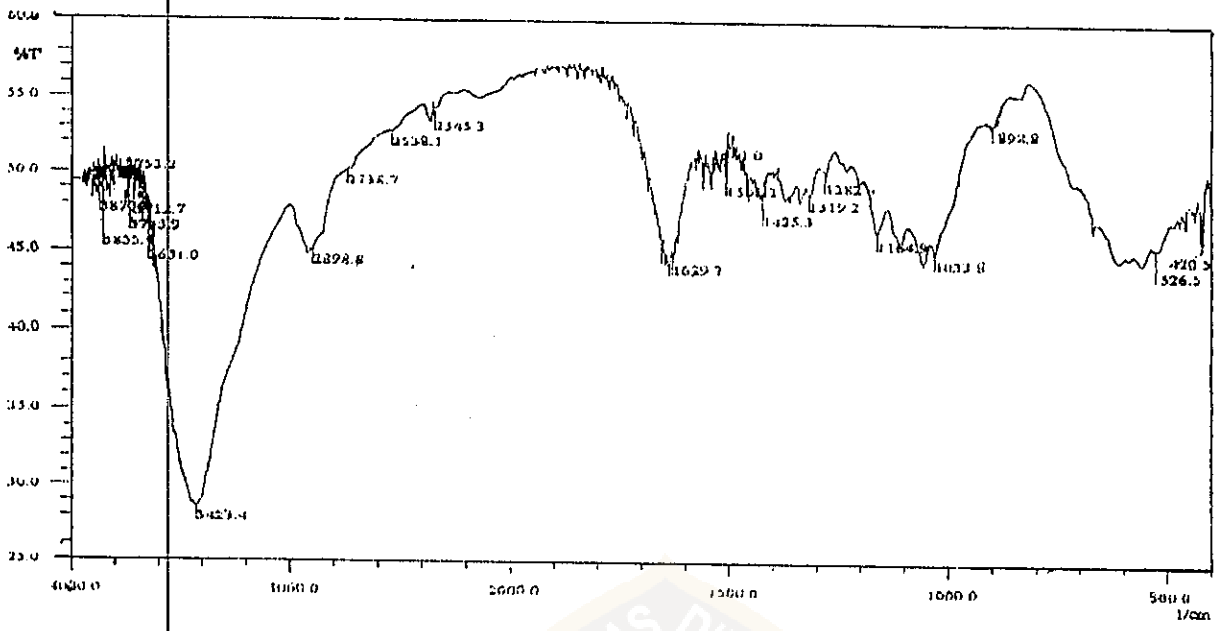


— Tatik D, zat warna 3 ml, pelet, 19 April 2005

Peaktable of TATIK4.IRS, 24 Peaks
Threshhold: 80, Noise: 2, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	420.5	34.293
2	925.8	43.611
3	1022.2	31.186
4	1315.4	42.076
5	1373.2	40.075
6	1419.5	36.893
7	1458.1	35.055
8	1519.8	33.447
9	1542.9	31.230
10	1651.0	26.799
11	1770.5	45.757
12	1828.4	50.002
13	1843.8	50.216
14	1867.0	50.945
15	2322.1	50.405
16	2931.6	36.738
17	3421.5	14.874
18	3649.1	24.653
19	3672.2	28.384
20	3749.4	29.218
21	3803.4	33.568
22	3818.8	32.982
23	3838.1	32.008
24	3903.7	33.187

Gambar B.6 Spektra IR *nata de coco* tanpa zat warna (Maulani, 2002)



Lampiran C Data pengukuran kekuatan tarik selulosa *nata de coco* dan Perhitungan kekuatan regang bioselulosa *nata de coco*

Lampiran C.1 Data pengukuran kekuatan tarik selulosa *nata de coco*

UNIVERSITAS GADJAH MADA YOGYAKARTA
Laboratorium Fisika Zat Padat Fakultas MIPA
Phone (0274) 902381

Hasil Pengukuran Analisis Tensil Strenght
Alat yang dipakai : PHOTOELASTIC STRESS EXPERIMENTAL APPARATUS
(dengan modifikasi)

No.	Sampel	Hasil Pengukuran (variasi lebar, panjang = tetap)			
		a	b	c	rerata
1.	Tanpa 2 W	9,0 kg	9,0 kg	9,0 kg	9,0 kg
2.	2 W 1 mL	6,5 kg	5,0 kg	5,5 kg	5,7 kg
3.	2 W 1,5 mL	7,5 kg	5,5 kg	5,0 kg	6,0 kg
4.	2 W 2 mL	8,0 kg	8,0 kg	7,5 kg	7,8 kg
5.	2 W 2,5 mL	9,0 kg	8,0 kg	9,5 kg	8,8 kg
6.	2 W 3 mL	7,5 kg	6,0 kg	8,0 kg	7,2 kg

Keterangan :

- Pengukuran dilakukan dengan 3 variasi lebar .
  a = 0,5 cm
  b = 1,0 cm
  c = 1,5 cm
- Hasil pengukuran dalam orde kilo gram (kg).
  Rerata = hasil pengukuran rata-rata dari 3 variasi pengukuran.
- Panjang sampel yang diukur = 5 cm (semua sama)

Yogyakarta, 23 April 2005

Lampiran C.2 Perhitungan kekuatan tarik *nata de coco*

$$\sigma = \frac{M \times g}{L}$$

σ = kekuatan regang

M = massa (kg)

L = luas sample (m^2)

g = 9,807 ms^{-2}

Variasi Luas:

A = Luas $2{,}5.10^{-4}$ m^2

B = Luas 5.10^{-4} m^2

C = Luas $7{,}5.10^{-4}$ m^2

Sampel	Luas (m^2)	Massa (kg)	σ (kPa)	Σ rata-rata (kPa)
Tanpa Zat Warna	A	9	353,052	215,754
	B	9	176,526	
	C	9	117,684	
ZW 1 mL	A	6,5	254,982	141,657
	B	5	98,070	
	C	5,5	71,918	
ZW 1,5 mL	A	7,5	294,210	155,822
	B	5,5	107,877	
	C	5	65,380	
ZW 2 mL	A	8	313,824	189,602
	B	8	156,912	
	C	7,5	98,070	
ZW 2,5 mL	A	9	353,052	211,395
	B	8	156,912	
	C	9,5	124,222	
ZW 3 mL	A	7,5	294,210	172,167
	B	6,0	117,684	
	C	8,0	104,608	

Lampiran D Data spektra XRD *nata de coco* dengan zat warna *Cochineal Red A* (1 mL) dan perhitungan perubahan kristalinitas nata de coco dengan zat warna *Cochineal Red A*

Lampiran D.1 Data spektra XRD *nata de coco* dengan zat warna *Cochineal Red A* (1mL)

* * * Basic Data Process * * *
Group Name : standard
Data Name : tatik01
File Name : tatik01. PKR
Sample Name : Cellulosa natadecoco
Comment : Dengan zat warna

Strongest 3 peaks

No	peak no.	2Theta (deg)	d (A)	I/I	FWHM (deg)	Intensitas (Counts)	IntegratedInt (Counts)
1	5	23.0052	3.86285	100	1.47230	11112	361250
2	2	14.5626	6.07771	46	2.11410	5163	212829
3	4	20.8000	4.26714	30	1.49100	3307	124027

Peak Data List

peak no.	2Theta (deg)	d (A)	I/I	FWHM (deg)	Intensitas (Counts)	IntegratedInt (Counts)
1	9.8500	8.97245	3	2.80000	342	33597
2	14.5627	6.07771	46	2.11410	5163	212829
3	17.0500	5.19627	15	1.93040	1681	78182
4	20.8000	4.26714	30	1.49100	3307	124027
5	23.0052	3.86285	100	1.47230	11112	361250

Lampiran D.2 Perhitungan Perubahan Kristalinitas *nata de coco* dengan zat warna *Cochineal Red A*

1. Sampel Bioselulosa *nata de coco*, dihitung berdasarkan spektra lampiran H

No.Puncak	2θ	(A)	I/II	FWHM	Intensitas (Counts)
1	14,3618	6,16228	53	2,32360	2595
2	20,3600	4,35835	37	3,80000	1841
3	22,4359	3,95956	100	1,66190	4934

Luas sampel Bioselulosa *nata de coco* tanpa zat warna

= (2,32360 x 2595) + (3,80000 x 1841) + (1,66190 x 4934)

= 21225,3566

2. Sampel Bioselulosa nata de coco, dihitung berdasarkan lampiran I

No.Puncak	2θ	(A)	I/II	FWHM	Intensitas (Counts)
1	14,5627	6,07771	46	2,11410	5163
2	20,8000	4,26714	30	1,49100	3307
3	23,0052	3,86285	100	1,47230	11112

Luas sampel bioselulosa *nata de coco* dengan zat warna *cochineal re A*

= (2,11410 x 516) + (1,49100 x 3307) + (1,47230 x 11112)

= 32206,0329

% perubahan kristalinitas bioselulosa *nata de coco*

$$= \frac{\Sigma \text{ luas sampel bioselulosa dengan zat warna}}{\Sigma \text{ luas sampel bioselulosa dengan zat warna}} \times 100\ \%$$

$$= \frac{2206{,}0329}{21225{,}3566}$$

$$= 151{,}7337\ \%$$