LAMPIRAN A

Data eksperimen sintesis selulosa asetat dalam media fermentasi bioselulosa

*nata de coco*

<table>
<thead>
<tr>
<th>Media Air Kelapa</th>
<th>Katalis</th>
<th>Asam Asetat Anhidrat</th>
<th>Asam Asetat</th>
<th>pH</th>
<th>Hasil</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ml</td>
<td>3 tetes</td>
<td>2,5 ml</td>
<td>-</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>100 ml</td>
<td>-</td>
<td>3 tetes</td>
<td>2,5 ml</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>100 ml</td>
<td>3 tetes</td>
<td>-</td>
<td>10 ml</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>100 ml</td>
<td>-</td>
<td>3 tetes</td>
<td>10 ml</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Lampiran B

Perbandingan absorbansi spektra FTIR selulosa asetat dari bioselulosa *nata de coco* dan selulosa pulp kayu

<table>
<thead>
<tr>
<th>Selulosa asetat dari bioselulosa</th>
<th>Selulosa asetat dari Pulp kayu (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>nata de coco</em></td>
<td></td>
</tr>
<tr>
<td>Panjang gel. ( \lambda ) ( \text{cm}^{-1} )</td>
<td>Gugus fungsi</td>
</tr>
<tr>
<td>1033,8</td>
<td>C-O Selulosa</td>
</tr>
<tr>
<td>1259,4</td>
<td>C-O asetil</td>
</tr>
<tr>
<td>1635,5</td>
<td>C=O ester</td>
</tr>
<tr>
<td>2916,2</td>
<td>C-H</td>
</tr>
<tr>
<td>3587,4</td>
<td>OH Selulosa</td>
</tr>
</tbody>
</table>

(*) Prisulistyono, 1996.
Lampiran C

Perhitungan perubahan kristalinitas selulosa asetat dari bioselelusa *nata de coco*

1. Sampel Bioselulosa *Nata de Coco*, dihitung berdasarkan spektra Lampiran 3.1

<table>
<thead>
<tr>
<th>No.Puncak</th>
<th>2θ</th>
<th>d (Å)</th>
<th>I/II</th>
<th>FWHM</th>
<th>Intensitas (Counts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14,3618</td>
<td>6,16228</td>
<td>53</td>
<td>2,32360</td>
<td>2595</td>
</tr>
<tr>
<td>2</td>
<td>20,3600</td>
<td>4,35835</td>
<td>37</td>
<td>3,80000</td>
<td>1841</td>
</tr>
<tr>
<td>3</td>
<td>22,4359</td>
<td>3,95956</td>
<td>100</td>
<td>1,66190</td>
<td>4934</td>
</tr>
</tbody>
</table>

Luas sampel Bioselulosa *Nata de Coco*

\[ = (2,32360 \times 2595) + (3,80000 \times 1841) + (1,66190 \times 4934) \]

\[ = 21225,36 \]

2. Sampel Selulosa Asetat, dihitung berdasarkan spektra Lampiran 3.2

<table>
<thead>
<tr>
<th>No.Puncak</th>
<th>2θ</th>
<th>d (Å)</th>
<th>I/II</th>
<th>FWHM</th>
<th>Intensitas (Counts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43,9241</td>
<td>2,05967</td>
<td>1000</td>
<td>0,17690</td>
<td>2095</td>
</tr>
<tr>
<td>2</td>
<td>22,1000</td>
<td>4,01898</td>
<td>33</td>
<td>0,00000</td>
<td>693</td>
</tr>
<tr>
<td>3</td>
<td>39,3996</td>
<td>2,28513</td>
<td>32</td>
<td>0,1510</td>
<td>668</td>
</tr>
</tbody>
</table>

Luas sampel Selulosa Asetat

\[ = (0,17690 \times 2095) + (0,00000 \times 693) + (0,1510 \times 668) \]

\[ = 471,67 \]
% perubahan kristalinitas selulosa asetat

\[ \frac{\Sigma \text{luas sampel Selulosa Asetat}}{\Sigma \text{luas sampel Bioselulosa Nata de Coco}} \times 100 \%
\]

\[ = \frac{471.67}{21225.36} \times 100 \%
\]

\[ = 2.22 \%
\]
LAMPIRAN C.1

Spektra XRD bioselulosa nata de coco (Rahayu, 2003)
LAMPIRAN C.2
Spektra XRD seholosa asetat

[Graph showing XRD spectrum with various peaks and labels along the axes.]
Lampiran D

Perhitungan kekuatan tarik selulosa asetat

Dihitung berdasarkan Lampiran 4.1

Diketahui:  
L = luas sampel = 1 x 4 cm² = 4 cm² = 4 x 10⁻⁴ m²

G = percepatan gravitasi = 9,807 ms⁻²

M = Massa yang digunakan untuk menarik sampel, Kg

M₁ = 2,33 Kg
M₂ = 2,5 Kg
M₃ = 1,92 Kg
M₄ = 1,08 Kg
M₅ = 1,75 Kg

Rumus: \( \sigma = \frac{F}{L} \)

\( \sigma \) = kekuatan tarik (Pascal, Pa)

F = Gaya, Newton (N)

L = Luas, m²

\( \sigma = \frac{M \times g}{L} \)

M = Massa, Kg

G = percepatan gravitasi

= 9,807 ms⁻²

Sampel 1

\( \sigma₁ = \frac{M₁ \times g}{L} = \frac{2,33Kg \times 9,807 \text{ ms}^{-²}}{4 \times 10⁻⁴ \text{ m}²} = 57125,8 \text{Pa} \)

= 57,13 KPa
Sample 2

\[ \sigma_2 = \frac{M_2 \times g}{L} = \frac{2.5 Kg \times 9,807 \text{ ms}^{-2}}{4 \times 10^{-4} \text{ m}^2} = 61293.8 \text{ Pa} = 61.29 \text{ kPa} \]

Sample 3

\[ \sigma_3 = \frac{M_3 \times g}{L} = \frac{1.92 Kg \times 9,807 \text{ ms}^{-2}}{4 \times 10^{-4} \text{ m}^2} = 47073.6 \text{ Pa} = 47.07 \text{ kPa} \]

Sample 4

\[ \sigma_4 = \frac{M_4 \times g}{L} = \frac{1.08 Kg \times 9,807 \text{ ms}^{-2}}{4 \times 10^{-4} \text{ m}^2} = 26478.9 \text{ Pa} = 26.48 \text{ kPa} \]

Sample 5

\[ \sigma_5 = \frac{M_5 \times g}{L} = \frac{1.75 Kg \times 9,807 \text{ ms}^{-2}}{4 \times 10^{-4} \text{ m}^2} = 42905.6 \text{ Pa} = 42.91 \text{ kPa} \]
Lampiran D.1

Data pengukuran kuat tarik selulosa asetat

<table>
<thead>
<tr>
<th>No</th>
<th>Sampel</th>
<th>Hasil Ukur (Kg)</th>
<th>Pengukuran Rata-rata (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1a</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1c</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>5a</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5b</td>
<td>2</td>
<td>2,5</td>
</tr>
<tr>
<td></td>
<td>5c</td>
<td>3,5</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>6a</td>
<td>2,5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6b</td>
<td>0,75</td>
<td>1,92</td>
</tr>
<tr>
<td></td>
<td>6c</td>
<td>2,5</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>7a</td>
<td>0,75</td>
<td>1,08</td>
</tr>
<tr>
<td></td>
<td>7b</td>
<td>1,5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7c</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>8a</td>
<td>1,5</td>
<td>1,75</td>
</tr>
<tr>
<td></td>
<td>8b</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8c</td>
<td>1,75</td>
<td></td>
</tr>
</tbody>
</table>

Yogyakarta, 30 Agustus 2004
Lampiran E.

Spektra inframerah selulosa acetat

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Pos. (1/cm)</th>
<th>Inten. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>439.7</td>
<td>37.945</td>
</tr>
<tr>
<td>2</td>
<td>472.5</td>
<td>30.913</td>
</tr>
<tr>
<td>3</td>
<td>555.5</td>
<td>40.241</td>
</tr>
<tr>
<td>4</td>
<td>659.6</td>
<td>40.517</td>
</tr>
<tr>
<td>5</td>
<td>815.6</td>
<td>37.239</td>
</tr>
<tr>
<td>6</td>
<td>1033.8</td>
<td>33.654</td>
</tr>
<tr>
<td>7</td>
<td>1259.4</td>
<td>34.568</td>
</tr>
<tr>
<td>8</td>
<td>1359.5</td>
<td>35.549</td>
</tr>
<tr>
<td>9</td>
<td>2430.1</td>
<td>34.812</td>
</tr>
<tr>
<td>10</td>
<td>2916.2</td>
<td>33.182</td>
</tr>
<tr>
<td>11</td>
<td>3149.5</td>
<td>32.583</td>
</tr>
<tr>
<td>12</td>
<td>3597.4</td>
<td>35.909</td>
</tr>
</tbody>
</table>