

LAMPIRAN I. DOKUMENTASI



Pengambilan sampah organik



Pengujian densitas



Pengujian nilai kalor



Pencampuran bahan baku dengan perekat



Pengujian kadar air



Pengujian *volatile matter*



Pengujian kadar abu

LAMPIRAN 2. PERHITUNGAN

PERHITUNGAN

- Nilai Kalor

$$A_1 = 6667 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{6,667}{0,2388} = 27,918 \frac{\text{MJ}}{\text{Kg}}$$

$$A_2 = 6464 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{6,464}{0,2388} = 27,068 \frac{\text{MJ}}{\text{Kg}}$$

$$A_3 = 6069 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{6,069}{0,2388} = 25,414 \frac{\text{MJ}}{\text{Kg}}$$

$$B_1 = 5738 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,738}{0,2388} = 24,028 \frac{\text{MJ}}{\text{Kg}}$$

$$B_2 = 5680 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,680}{0,2388} = 23,785 \frac{\text{MJ}}{\text{Kg}}$$

$$B_3 = 5522 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,522}{0,2388} = 23,123 \frac{\text{MJ}}{\text{Kg}}$$

$$C_1 = 5320 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,320}{0,2388} = 22,918 \frac{\text{MJ}}{\text{Kg}}$$

$$C_2 = 5210 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,210}{0,2388} = 21,817 \frac{\text{MJ}}{\text{Kg}}$$

$$C_3 = 5110 \frac{\text{kal}}{\text{g}} + \frac{1 \text{ joule}}{0,2388} \times \frac{10^6 \text{ MJ}}{10^6 \text{ MJ}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = \frac{5,110}{0,2388} = 21,398 \frac{\text{MJ}}{\text{Kg}}$$

- Kadar Air

$$A_1 = \frac{w_1}{w_2} \times 100 = \frac{(43,5141-43,5036)}{1,0099} \times 100 = \frac{0,0105}{1,0099} \times 100 = 1,03\%$$

$$A_2 = \frac{w_1}{w_2} \times 100 = \frac{(26,7447-26,7225)}{1,0016} \times 100 = \frac{0,0222}{1,0016} \times 100 = 2,21\%$$

$$A_3 = \frac{w_1}{w_2} \times 100 = \frac{(27,6506-27,6232)}{1,0082} \times 100 = \frac{0,0274}{1,0082} \times 100 = 2,71\%$$

$$B_1 = \frac{w_1}{w_2} \times 100 = \frac{(43,4309-47,4035)}{1,0021} \times 100 = \frac{0,0274}{1,0021} \times 100 = 2,73\%$$

$$B_2 = \frac{w_1}{w_2} \times 100 = \frac{(27,8412-27,8026)}{1,0004} \times 100 = \frac{0,0386}{1,0004} \times 100 = 3,85\%$$

$$B_3 = \frac{w_1}{w_2} \times 100 = \frac{(43,4309-47,4035)}{1,0021} \times 100 = \frac{0,0274}{1,0021} \times 100 = 5,99\%$$

$$C_1 = \frac{w_1}{w_2} \times 100 = \frac{(27,7571-27,6988)}{1,0054} \times 100 = \frac{0,0583}{1,0054} \times 100 = 5,78\%$$

$$C_2 = \frac{w_1}{w_2} \times 100 = \frac{(38,4614-38,4025)}{1,0068} \times 100 = \frac{0,0589}{1,0068} \times 100 = 5,85\%$$

$$C3 = 1 \frac{w1}{w2} x 100 = \frac{(27,7571-27,6988)}{1,0085} x 100 = \frac{0,0583}{1,0054} x 100 = 5,78 \%$$

- Kadar Abu

$$A_1 = \frac{w1}{w2} x 100 = \frac{(44,2514-44,0510)}{2,0017} x 100 = \frac{0,2004}{2,0017} x 100 = 10\%$$

$$A2 = \frac{w1}{w2} x 100 = \frac{(45,2054-45,0025)}{2,0056} x 100 = \frac{0,2029}{2,0056} x 100 = 10,11\%$$

$$A3 = \frac{w1}{w2} x 100 = \frac{(43,2349-43,0302)}{2,0042} x 100 = \frac{0,2047}{2,0042} x 100 = 10,21\%$$

$$B1 = \frac{w1}{w2} x 100 = \frac{(46,2922-46,0652)}{2,0056} x 100 = \frac{0,227}{2,0017} x 100 = 11,4\%$$

$$B2 = \frac{w1}{w2} x 100 = \frac{(46,3234-46,0871)}{2,0054} x 100 = \frac{0,2439}{2,0017} x 100 = 11,7\%$$

$$B3 = \frac{w1}{w2} x 100 = \frac{(46,3133-46,0765)}{2,0058} x 100 = \frac{0,2004}{2,0017} x 100 = 11,8\%$$

$$C1 = \frac{w1}{w2} x 100 = \frac{(45,3690-45,0945)}{2,0010} x 100 = \frac{0,2745}{2,0010} x 100 = 13,71\%$$

$$C2 = \frac{w1}{w2} x 100 = \frac{(42,6425-42,0764)}{2,0070} x 100 = \frac{0,29320}{2,0017} x 100 = 14,4\%$$

$$C3 = \frac{w1}{w2} x 100 = \frac{(43,3762-43,0821)}{2,0017} x 100 = \frac{0,29399}{2,0017} x 100 = 14,6\%$$

- *Volatil matter*

$$A_1 = \frac{(W2-W1)}{W1} x 100 = \frac{(46,5981-46,5002)}{1,0053} x 100 = 9,73\%$$

$$A2 = \frac{(W2-W1)}{W1} x 100 = \frac{(45,2054-45,0025)}{2,0056} x 100 = 9,18\%$$

$$A3 = \frac{(W2-W1)}{W1} x 100 = \frac{(43,2349-43,0302)}{2,0042} x 100 = 8,70\%$$

$$B1 = \frac{(W2-W1)}{W1} x 100 = \frac{(46,2922-46,0652)}{2,0056} x 100 = 8,63\%$$

$$B2 = \frac{w1}{w2} x 100 = \frac{(46,3234-46,0871)}{2,0054} x 100 = 8,57\%$$

$$B3 = \frac{w1}{w2} x 100 = \frac{(46,3133-46,0765)}{2,0058} x 100 = 8,01\%$$

$$C1 = \frac{w1}{w2} x 100 = \frac{(45,3690-45,0945)}{2,0010} x 100 = 7,61\%$$

$$C2 = \frac{w1}{w2} x 100 = \frac{(42,6425-42,0764)}{2,0070} x 100 = 4,61$$

$$C3 = \frac{w1}{w2} x 100 = \frac{(43,3762-43,0821)}{2,0017} x 100 = 3,99$$

- Kadar Karbon Tetap

$$A_1 = 100 - (10 + 9,73) = 80,27 \%$$

$$A_2 = 100 - (9,18 + 10,11) = 80,71\%$$

$$A_3 = 100 - (8,7 + 10,21) = 81,09\%$$

$$B_1 = 100 - (8,63 + 11,4) = 79,97\%$$

$$B_2 = 100 - (8,57 + 11,7) = 79,73\%$$

$$B_3 = 100 - (8,01 + 11,8) = 80,19\%$$

$$C_1 = 100 - (7,16 + 13,71) = 79,13\%$$

$$C_2 = 100 - (4,6 + 14,4) = 81\%$$

$$C_3 = 100 - (3,99 + 14,6) = 81,4\%$$