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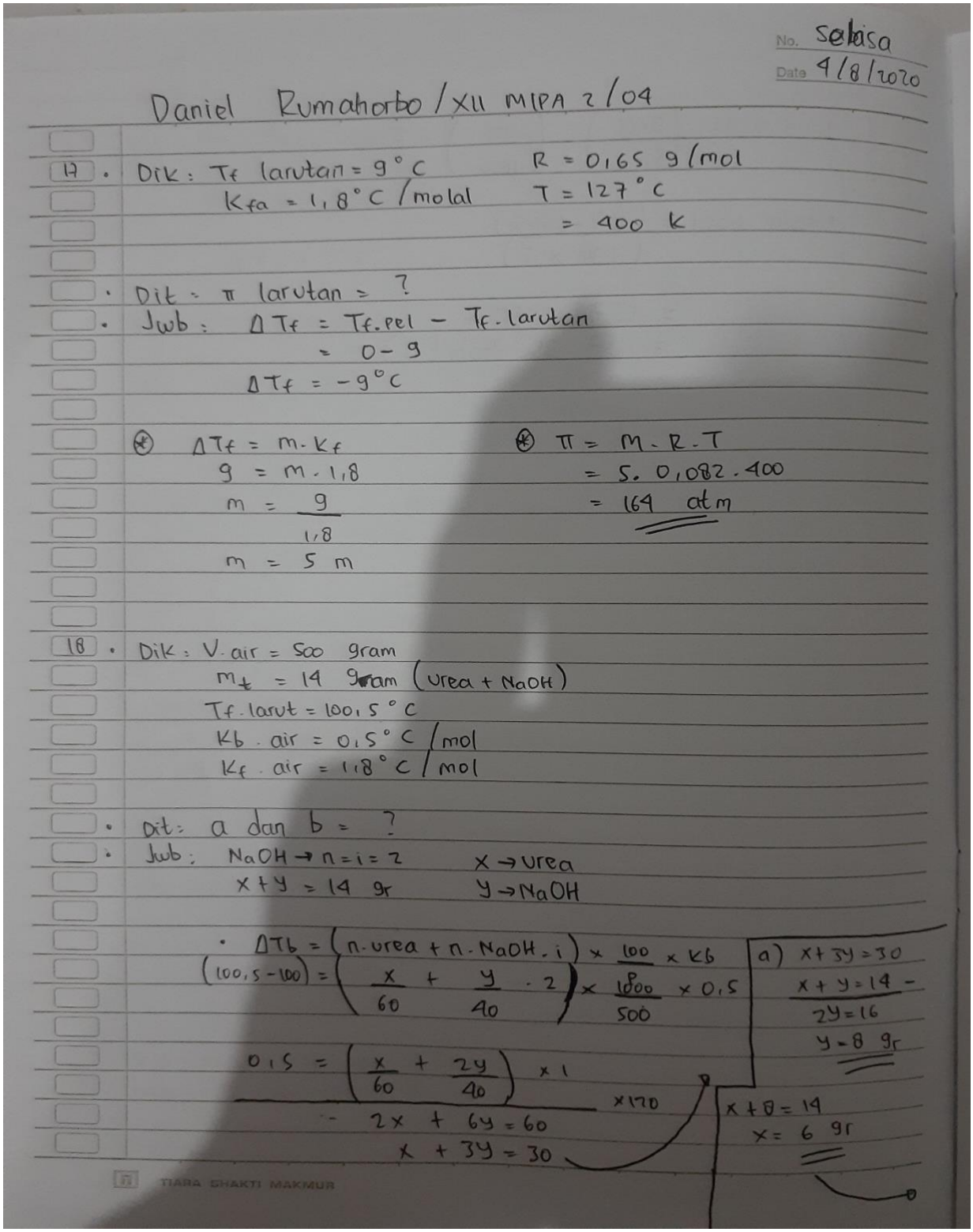
KELAS : XII MIPA 2

ABSEN : 04



No. Selasa
Date 4/8/2020

Daniel Rumahorbo / XII MIPA 2 / 04

17. Dik : T_f larutan = 9°C
K_{fa} = 1,8°C / molal
R = 0,165 g/mol
T = 127°C
= 400 K

Dit : π larutan = ?

Jwb : $\Delta T_f = T_{f.pel} - T_{f.larutan}$
$= 0 - 9$
$\Delta T_f = -9°C$

✱ $\Delta T_f = m \cdot K_f$
$9 = m \cdot 1,8$
$m = \frac{9}{1,8}$
$m = 5\ m$

✱ $\pi = M \cdot R \cdot T$
$= 5 \cdot 0,082 \cdot 400$
$= 164$ atm

18. Dik : V. air = 500 gram
m_t = 14 gram (urea + NaOH)
$T_{f.larut}$ = 100,5°C
$K_{b\ .\ air}$ = 0,5°C / mol
$K_{f\ .\ air}$ = 1,8°C / mol

Dit : a dan b = ?

Jwb : NaOH → n = i = 2
x → urea
y → NaOH
x + y = 14 gr

$\Delta T_b = (n.urea + n.NaOH \cdot i) \times \frac{100}{} \times K_b$
$(100,5 - 100) = \left(\frac{x}{60} + \frac{y}{40} \cdot 2\right) \times \frac{1000}{500} \times 0,5$

$0,5 = \left(\frac{x}{60} + \frac{2y}{40}\right) \times 1$ ×120
$2x + 6y = 60$
$x + 3y = 30$

a) $x + 3y = 30$
$x + y = 14$ −
$2y = 16$
$y = 8$ gr

$x + 8 = 14$
$x = 6$ gr

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b) $\Delta T_f = \left(\frac{x}{60} + \frac{y}{40} \cdot 2 \right) \times \frac{1000}{500} \times 1,8$

$= \left(\frac{6}{60} + \frac{8}{40} \cdot 2 \right) \times 3,6$

$= \left(\frac{1}{10} + \frac{2}{5} \right) \times 3,6$

$= 1+4/10 = 0,5$

$= 0,5 \times 3,6 = 1,8$

$\Delta T_f = T_{f\text{-pel}} - T_{f\text{-lar}}$

$1,8 = 0 - T_{f\text{-lar}}$

- $T_{f\text{-larutan}} = -1,8^\circ C$

19. DIK : m. air = 100 gr P = 196,8 mmHg
P° = 204 mmHg m. $H_2C_2O_4$ = 10 gr

- DIT : α = ?
- Jwb : n. $H_2C_2O_4 = \frac{m}{mr} = \frac{10}{90} = \frac{1}{9}$

n. $H_2O = \frac{100}{18} = \frac{50}{9}$

- Ionisasi $H_2C_2O_4$

$H_2C_2O_4 \rightarrow 2H^+ + C_2O_4^{2-}$

n = 3

- $\Delta P = X_t \cdot P^\circ \cdot i$

$204 - 196,8 = \frac{n.\ H_2C_2O_4}{n.\ total} \cdot 204 \cdot (1 + (n-1)\alpha)$

$7,2 = \frac{1/9}{51/9} \cdot 204 \cdot (1 + 2\alpha)$

$1 + 2\alpha = \frac{7,2 \cdot 51}{204}$

$1 + 2\alpha = 1,8$

$2\alpha = 0,8$

$\alpha = 0,4$

20. Dik : V. gula = 500 mL $T = 27^\circ C \rightarrow 300\ K$
M_r . gula = 150 $\rho = 1{,}23$ gr/mL
$\pi = 4{,}92$ atm K_f - air = 1,8 °C/mol

• Dit : T_f . larutan = ?

• Jwb : • $\pi = M \cdot R \cdot T$

$4{,}92 = M \cdot 0{,}082 \cdot 300$

$M = \frac{4{,}92}{24{,}6} = 0{,}2\ M$

• $\rho = \frac{m}{V} \rightarrow 1{,}23 = \frac{m}{500}$

$m = 615$ gr

• $m = \frac{m}{M_r} \times \frac{1000}{P}$

$0{,}2 = \frac{615}{150} \times \frac{1000}{P}$

$P = 20 \cdot 500$

• $\Delta T_f = m \cdot K_f$

$= 0{,}2 \cdot 1{,}8$

$= 0{,}36$

• $\Delta T_f = T_f$. pel − T_f . larutan

$0{,}36 = 0 - T_f$. larutan

T_f - larutan = 0,36 °C

21. Dik : m . $MgSO_4$ = 256 gr V. air + = 750 gr
$T_p = 100{,}2^\circ C$ $K_p = 0{,}5\ ^\circ C/mol$

• Dit : T_b = ?

• Jwb : $MgSO_4 \rightarrow Mg^{2+} + SO_4^{2-}$

• $\Delta T_b = T_b$. pel − T_b . lar

$= 100{,}2 - 100$

$= 0{,}2^\circ C$

• $\Delta T_b = m \cdot k_b \cdot i$

$0{,}2 = m \cdot 0{,}5 \cdot 2$

$m = 0{,}2$ (Awal

✱ r. Pengenceran → $m_1 V_1 = m_2 V_2$

$0{,}2 \cdot 256 = m_2 \cdot 1000$

$m_2 = 0{,}0508$

• $\Delta T_b = 0{,}0508 \cdot 0{,}5 \cdot 2$

$= 0{,}0508$

• $0{,}0508 = T_b$. lar − 100

T_b . larutan = 100,0508 °C

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22. Dik : m. glukosa = 518 gr T_f-lar = −0,73

T_f = −0,36 °C K_f.air = 1,8 °C/mol

- harga x atau m = ?
- Jwb : • $\Delta T_f = T_f.\text{Pel} - T_f.\text{lar}$

$= -0{,}36 - (-0{,}73)$

$= 0{,}37$

- $\Delta T_f = \frac{m}{Mr} \times \frac{1000}{P} \times K_f$

$0{,}37 = \frac{m}{151} \times \frac{1000}{518} \times 1{,}8$

$m = \frac{0{,}37 \times 151 \times 518}{1800}$

$m = 16{,}078$ gr

23. Dik : V. H_2SO_4 = 200 mL 1 M T = 127 °C

V. NaOH = 300 mL 2 M = 400 K

- Dit : π = ?
- Jawab : $H_2SO_4 + 2\,NaOH \rightarrow NaSO_4 + 2H_2O$

m =	0,2	0,6			• i. NaOH = 2
r =	0,2	0,4	0,2	0,4	• i. $NaSO_4$ = 3
s =		0,2	0,2	0,4	

- $\pi = (n_1 \times i_1 + n_2 \times i_2) \times \frac{1000}{V\text{-tot}} \times R.T$

$= (0{,}2 \times 2 + 0{,}2 \times 3) \times \frac{1000}{500} \times 0{,}082 \times 400$

$= 1 \times 2 \times 0{,}082 \times 400$

$\pi = 65{,}6$ atm

24. Dik: m. NaOH = 8 gr Kf. air = 1,8°C/mol
V. air = 800 ml T = 127°C → 400 K

Dit: a dan b = ?

Jwb: a) $\Delta T_f = \frac{m}{Mr} \times \frac{1000}{P} \times Kf \times i$

$= \frac{8}{40} \times \frac{1000}{800} \times 1,8 \times 2$

$= 0,9\,^{\circ}C$

$\Delta T_f = T_f \text{ pel} - T_f \text{ lar}$

$T_f \text{ lar} = -0,9\,^{\circ}C$

b) $\pi = m.R.T$

$= \frac{8}{40} \times \frac{1000}{800} \times 0,082 \times 400$

$= 16,4$ atm

25. Dik: m. C = 40% m. ben = 25,6 gr Kf. ben = 5,12°C/mol
m. H = 6,67% T_f = 5,03 T_f = 5,48°C

Dit: rumus molekul = ?

Jwb: $C = \frac{40}{12} = 3,34 = 1$

$H = 6,67/1 = 6,67 = 2$

$O = \frac{53,33}{16} = 3,34 = 1$

CH_2O

$\Delta T_f = \frac{m}{Mr} \times \frac{1000}{P} \times Kf$

$(5,48 - 5,03) = \frac{0,405}{Mr} \times \frac{1000}{25,6}$

$Mr = \frac{81}{0,45} = 180$

$(CH_2O)n = 180$

$(12+2+16)n = 180$

$n = \frac{180}{30} = 6$

Rumus molekul:

$(CH_2O)_6 = C_6H_{12}O_6$