

1 Perbandingan mol (n)

gas ideal $\Rightarrow PV = n \cdot R \cdot T$

$R = \text{tetapan Rydberg} = 0,082 \frac{\text{L atm}}{\text{mol.K}}$

$$\frac{V}{n} = \frac{R \cdot T}{P} \rightarrow \text{konstan}$$

$$\frac{V_1}{n_1} = \frac{V_2}{n_2}$$

2 Mencari nilai mol (n)

$$n = \frac{\text{gram}}{A_r} \quad \text{atau} \quad n = \frac{\text{gram}}{M_r}$$

$M_r = \text{massa molekul relatif}$

$$\begin{aligned} \rightarrow M_r \text{ H}_2\text{O} &= 2 \times A_r \text{H} + 1 \times A_r \text{O} \\ &= 2 \times 1 + 1 \times 16 \\ &= 18 \end{aligned}$$

$$n = \frac{V_{\text{STP}}}{22,4}, \quad \text{STP} = \text{standar temperatur and pressure}$$

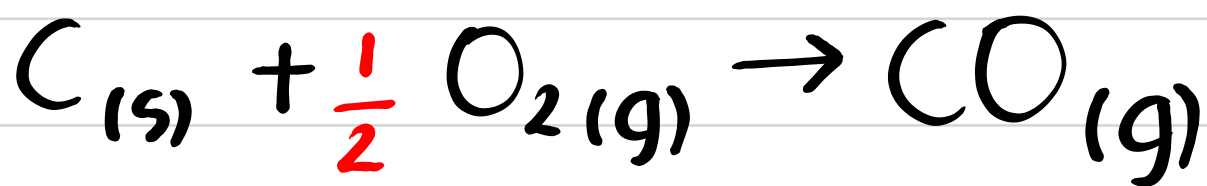
$$n = \frac{P \cdot V}{R \cdot T}, \quad \text{gas ideal}$$

$$n = \frac{V_{\text{RTP}}}{24}, \quad \text{RTP} = \text{Room Temp. and Pressure}$$

$$n = \frac{\sum \text{Partikel}}{6,02 \times 10^{23}}$$

③ Menyetarakan Persamaan Reaksi

➤ Sederhana



(menyamakan jumlah atom kiri & kanan)

Fase/wujud unsur & senyawa

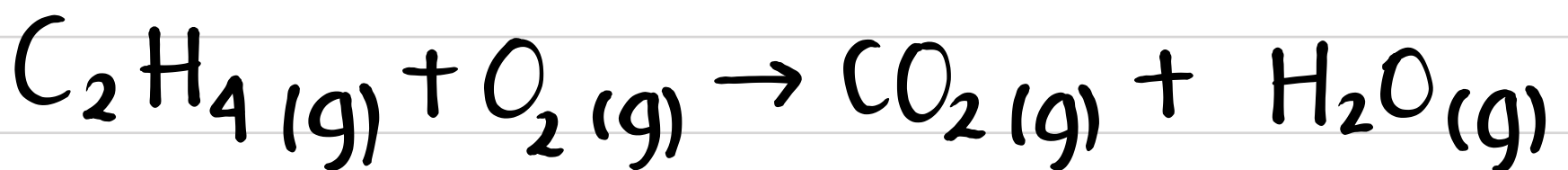
s (solid) = padat

l (liquid) = cair

aq (aquo) = berair

g (gases) = gas

➤ Hidrokarbon



➤ menyamakan jumlah atom C kiri & kanan



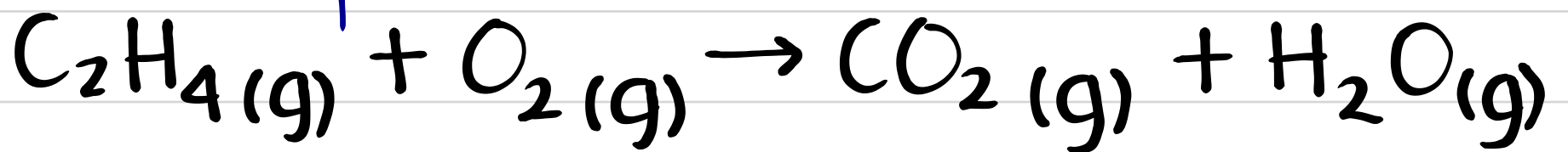
➤ menyetarakan jumlah atom H kiri & kanan



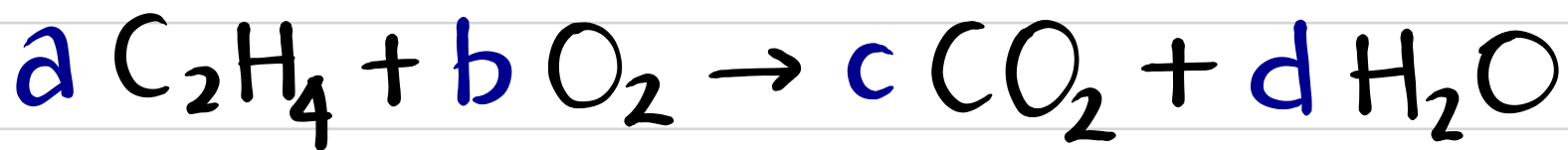
➤ menyetarakan atom O kiri & kanan



> Kompleks



Cara:



$$\text{C (Karbon)} \rightarrow 2a = c$$

$$\text{H (hidrogen)} \rightarrow \cancel{4}a = \cancel{2}d$$

$$2a = d$$

$$\text{O (Oksigen)} \rightarrow 2b = 2c + d$$

maka:

misal $a=1$, $2a=c$

$$2 \cdot 1 = c$$

$$c=2$$

$$2a = d$$

$$2 \cdot 1 = d$$

$$2 = d$$

$$2b = 2c + d$$

$$2b = 2 \cdot 2 + 2$$

$$b = 2 + 1 = 3$$

④ Mencari Biloks

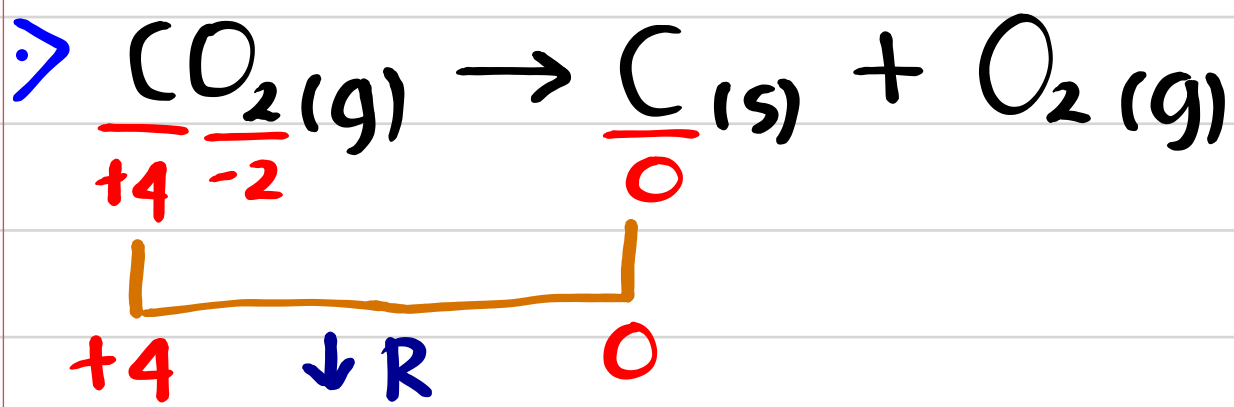


$$x + 2(-2) = 0$$

$$x - 4 = 0$$

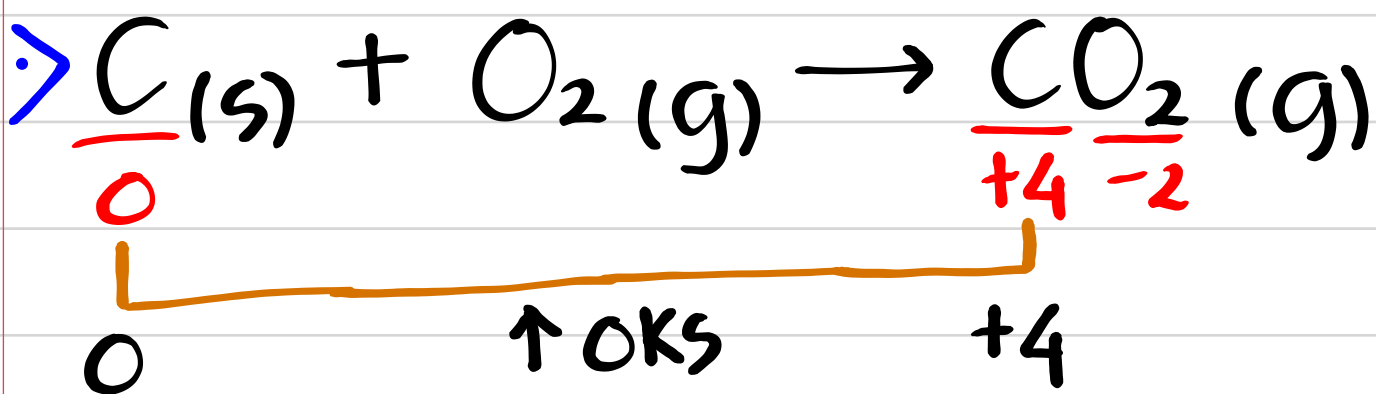
$$x = 4$$

⑤ Reduksi (penurunan Biloks)



Oksidator : CO_2
Hasil Reduksi : C

⑥ Oksidasi (kenaikan biloks)



Reduktor : C
Hasil oksidasi : CO_2

⑦ Molaritas (M)

$$M = \frac{\text{gram}}{\text{Mr}} \times \frac{1000}{\text{V}}$$

⑧ Massa Jenis (ρ)

$$\rho = \frac{\text{gram}}{\text{ml}} \text{ atau } \frac{\text{kg}}{\text{l}}$$

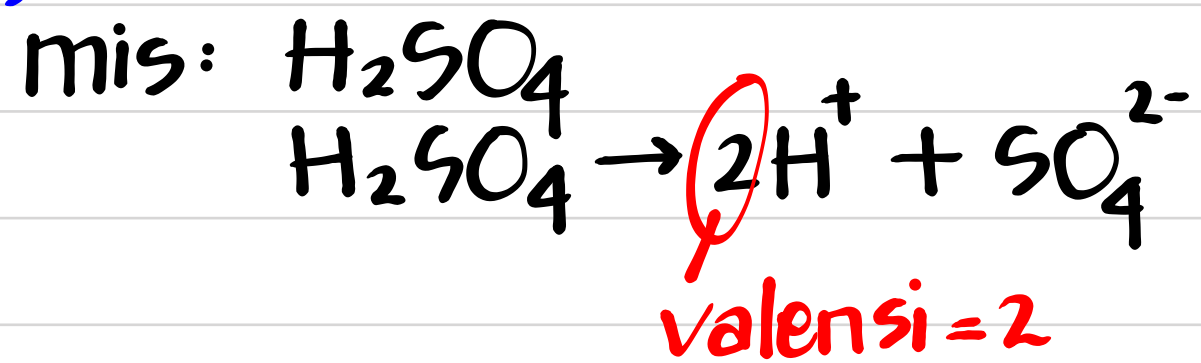
⑨ Molalitas (m)

$$m = \frac{\text{gram}}{\text{Mr}} \times \frac{1000}{\text{gram pelarut}}$$

⑩ Asam - Basa (pH & pOH)

➤ Asam Kuat

mis: H_2SO_4



valensi = 2

$$[H^+] = \text{valensi} \times M_a$$

$$pH = -\log[H^+]$$

➤ Asam Lemah

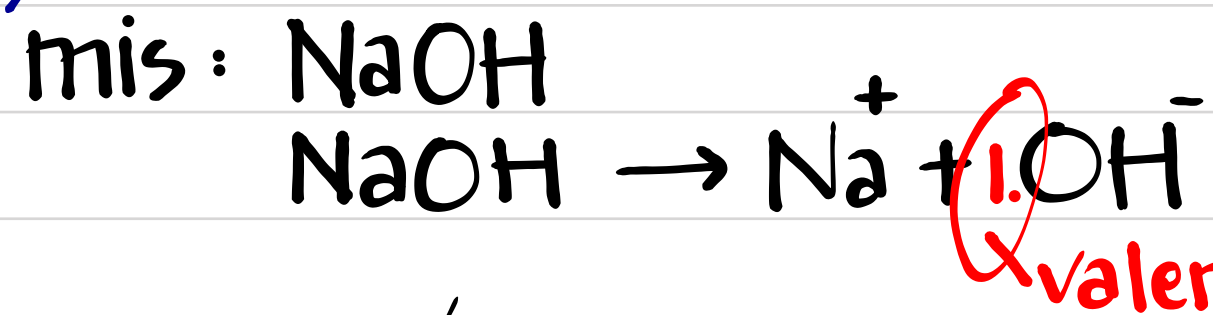
mis: CH_3COOH

$$[H^+] = \sqrt{K_a \cdot M_a}$$

$$pH = -\log[H^+]$$

➤ Basa Kuat

mis: $NaOH$



valensi = 1

$$[OH^-] = \text{valensi} \times M_b$$

$$pOH = -\log[OH^-]$$

$$pH = 14 - pOH$$

➤ Basa Lemah

mis: NH_3

$$[OH^-] = \sqrt{K_b \cdot M_b}$$

$$pOH = -\log[OH^-]$$

$$pH = 14 - pOH$$

② Hidrolisis

➤ Asam Lemah - Basa kuat

$$[\text{OH}^-] = \sqrt{\frac{K_w}{K_a} \times [\text{G}]}$$

$$K_w = 10^{-14}$$

$$K_a = \text{diket di soal} / 10^{-5}$$

➤ Asam Kuat - Basa Lemah

$$[\text{H}^+] = \sqrt{\frac{K_w}{K_b} \times [\text{G}]}$$

$$K_b = \text{diket di soal} / 10^{-5}$$

➤ Asam Kuat - Basa Kuat (tidak terhidrolisis)

➤ Asam Lemah - Basa Lemah (hidrolisis sempurna)

$[\text{H}^+]$ tidak bergantung pada konsentrasi garam, tetapi pada K_a dan K_b

$$K_a = K_b \rightarrow \text{pH} = 7$$

$$K_a > K_b \rightarrow \text{pH} < 7$$

$$K_a < K_b \rightarrow \text{pH} > 7$$

$$\text{Derajat Hidrolisis (h)} = \frac{[\text{G}] \text{ urai}}{[\text{G}] \text{ mula}} \approx$$

Ingat hidrolisis: sisa garam