Nama : Irfan Nur Fauzi

NIM : 21060117130082

1) $P_4 + 5O_2 \rightarrow P_4O_{10}$ $\Delta H = -3,013 \; kJ/mol$

Diket :

  Ar P : 31

  Mr P_4 = 4×31 = 124

  Jml mol ⟺ $n = \frac{m}{mr}$

    $= \frac{266}{124} = 2,15 \; mol$

$P_4 + 5O_2 \rightarrow P_4O$ $\Delta H = -3,013 \; kJ/mol$

Untuk membakar 1 mol P_4 dilepas kalor sebesar 3,013 kJ

↳ Untuk kalor yg dilepaskan ketika membakar 266 gram

  Fosfor putih = 2,15 mol × 3,013 kJ/mol

      = 6.477,95 kJ

2) Diket:

  $C + O_2 \rightarrow CO_2$ $\Delta H = -393,5 \; kJ \; mol^{-1}$

  $S + O_2 \rightarrow SO_2$ $\Delta H = -296,4 \; kJ \; mol^{-1}$

  $CS_2 + 3O_2 \rightarrow CO_2 + 2SO_2$ $\Delta H = -1073,6 \; kJ \; mol^{-1}$

ΔH pembentukan CS_2 ?

(i) $C + O_{2 \, (g)} \rightarrow CO_{2 \, (g)}$ $\Delta H = -393,5 \; kJ/mol$

(ii) $S + O_{2 \, (g)} \rightarrow SO_{2 \, (g)}$ $\Delta H = -296,4 \; kJ/mol$ ×2

(iii) $CS_{2 \, (s)} + 3O_{2 \, (g)} \rightarrow CO_{2 \, (g)} + 2SO_{2 \, (g)}$ $\Delta H = -1073,6 \; kJ/mol$
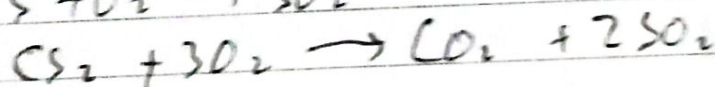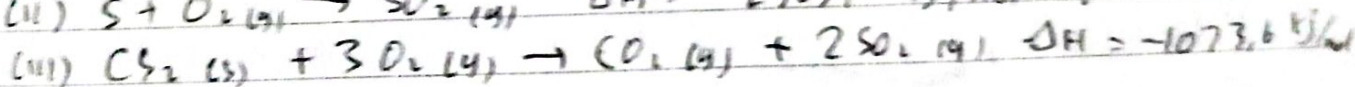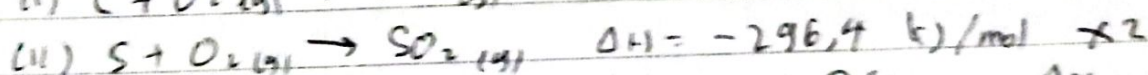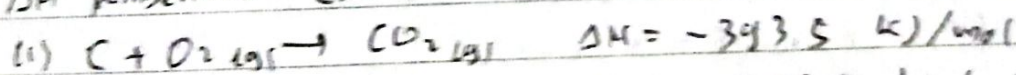
Pers (iii) dibalik produk & realitannya & berubah tanda ΔH positif

  $C + O_{2 \, (g)} \rightarrow CO_{2 \, (g)}$ $\Delta H = -393,5 \; kJ/mol$

  $2S + 2O_{2 \, (g)} \rightarrow 2SO_{2 \, (g)}$ $\Delta H = -592,8 \; kJ/mol$

  $2SO_{2 \, (g)} + CO_2 \rightarrow CS_2 + 3O_{2 \, (g)}$ $\Delta H = +1073,6 \; kJ/mol$

  R. → $C + 2S \rightarrow CS_2$ $\Delta H = +87,3 \; kJ/mol$

Nama : Irza Nur Fauzi
NIM : 21060117130082

3) $S_2O_8^{2-}{}_{(aq)} + 3I^-{}_{(aq)} \rightarrow 2SO_4^{2-}{}_{(aq)} + I_3^-{}_{(aq)}$
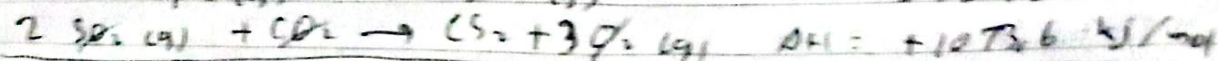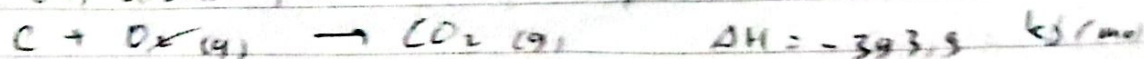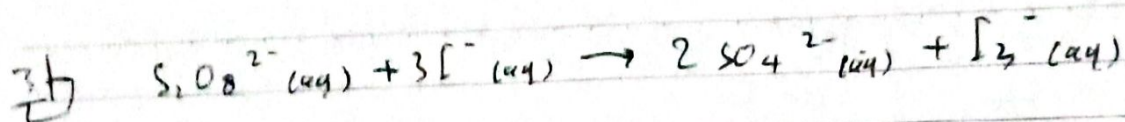
eksperimen	$[S_2O_8^{2-}]$ M	$[I^-]$ M	Laju awal (M/s)
1	0,08	0,034	$2,2 \times 10^{-4}$
2	0,08	0,017	$1,1 \times 10^{-4}$
3	0,16	0,017	$2,2 \times 10^{-4}$

a) Hukum Laju

$Laju = k[S_2O_8^{2-}]^x [I^-]^y$

→ Mencari orde x pd $S_2O_8^{2-}$.   percobaan 2 & 3

- $[S_2O_8^{2-}]$ meningkat 2x
- Laju awal meningkat 2x
- $x = \frac{2}{2} = 1$

→ Mencari orde y pd I^- Percobaan 1 & 2

- $[I^-]$ meningkat ½ x
- laju awal meningkat ½ x
- $y = \frac{1/2}{1/2} = 1$

Jadi laju $= k[S_2O_8^{2-}][I^-]$

b) konstanta laju

$laju = k[S_2O_8^{2-}][I^-]$

$2,2 \times 10^{-4} = k(0,08)(0,034)$

$k = \dfrac{2,2 \times 10^{-4}}{(0,08)(0,034)} = 0,08 /M \, det$

4) $H_2 + I_2 \rightleftharpoons 2HI$. $Vol = 1 L$
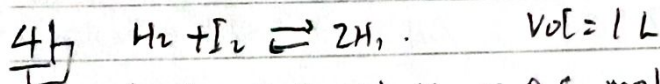
Awal = 0,5 mol H_2 x 0,5 mol I_2

Reaksi : (x mol H_2) (x mol I_2) (2x mol HI)

Seimbang : (0,5 - x) (0,5 - x) (2x)

$kc = [HI]^2 / [H_2][I_2]$

$54,3 = \dfrac{(2x)^2}{(0,5-x)(0,5-x)} = \dfrac{(2x)^2}{(0,5-x)^2}$

$\sqrt{54,3} = \dfrac{2x}{0,5-x}$

$7,368 (0,5 - x) = 2x$

$x = 0,39$

Dalam keadaan seimbang

$[H_2] = 0,5 - 0,39 = 0,11 M$

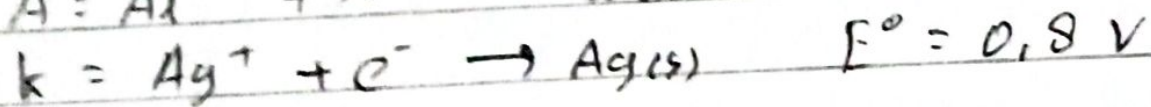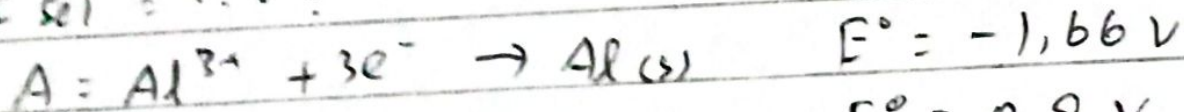$[I_2] = 0,5 - 0,39 = 0,11 M$

$[HI] = 2 \times 0,39 = 0,78 M$

Nama : Irza Mur Fauzi

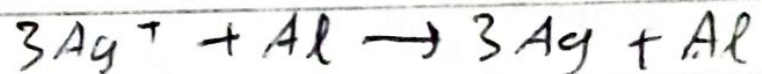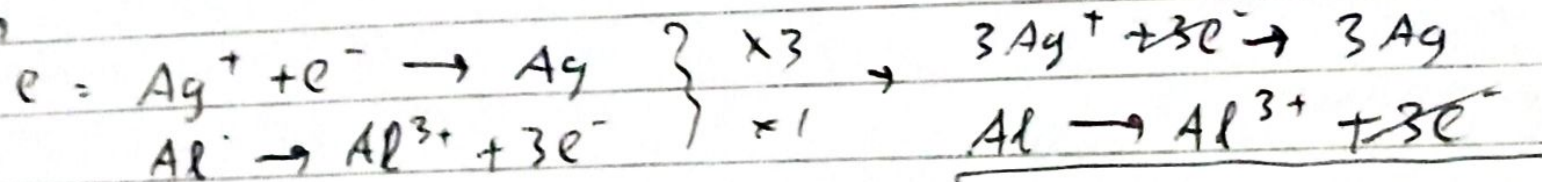HIM : 21060117130082

5) E sel = ...?

A = $Al^{3+} + 3e^- \rightarrow Al_{(s)}$ $E° = -1,66 V$

k = $Ag^+ + e^- \rightarrow Ag_{(s)}$ $E° = 0,8 V$

reaksi →

$\left. \begin{array}{l} e = Ag^+ + e^- \rightarrow Ag \\ Al \rightarrow Al^{3+} + 3e^- \end{array} \right\} \begin{array}{l} \times 3 \\ \times 1 \end{array}$ → $\begin{array}{l} 3Ag^+ + 3e^- \rightarrow 3Ag \\ \underline{Al \rightarrow Al^{3+} + 3e^-} \end{array}$

$3Ag^+ + Al \rightarrow 3Ag + Al$

E sel = E katoda - E anoda

= $0,8 - (-1,66)$

= $2,46 V$