

SECTION A AFDELING A**Question 1 VRAAG 1**

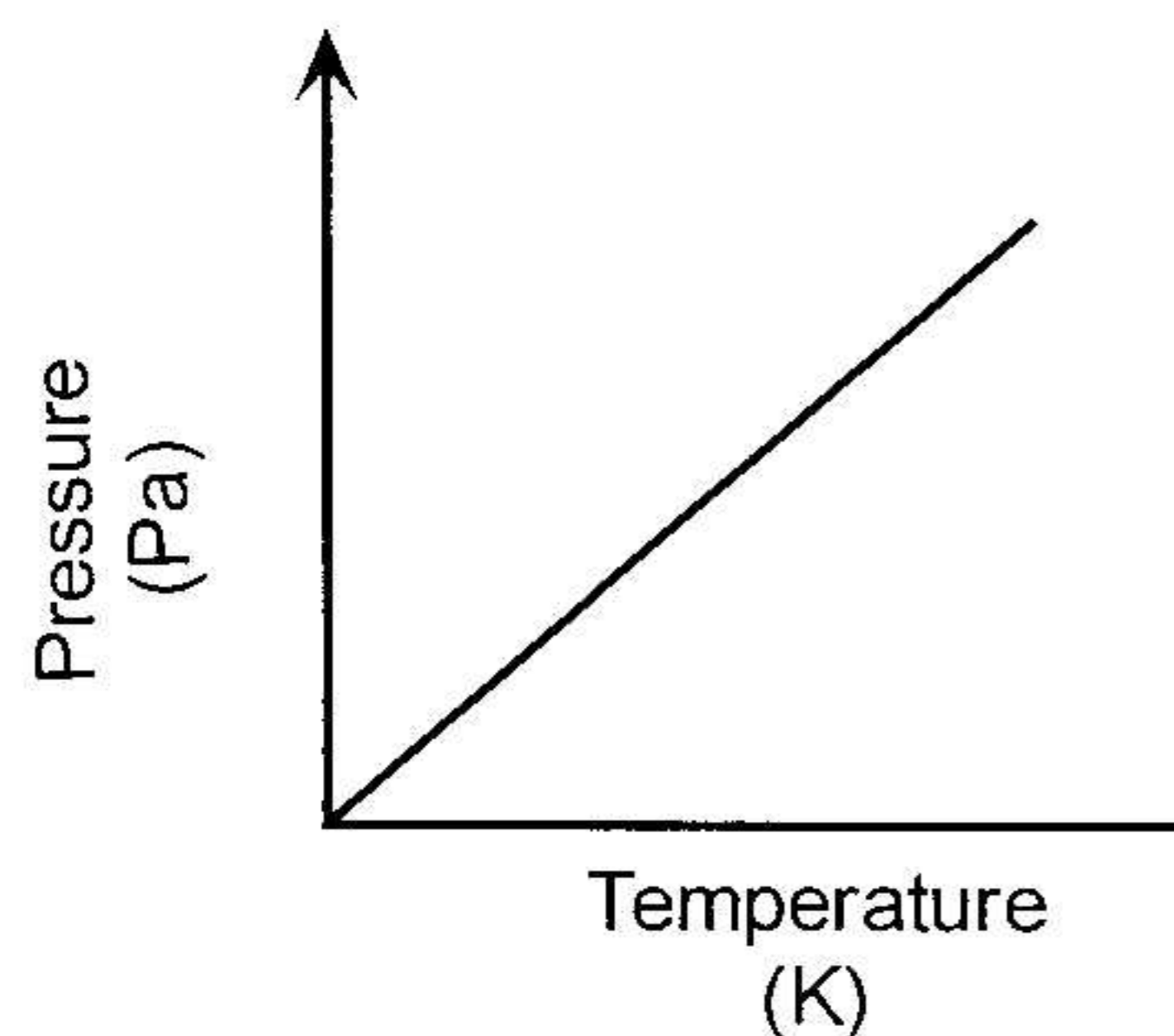
1.1	B	1.2	B	1.3	D	1.4	D	1.5	C
1.6	C	1.7	D	1.8	B	1.9	C	1.10	C
1.11	C	1.12	C	1.13	D	1.14	B	1.15	A

SUBTOTAL: 15 X 4 = [60]**Question 2 / VRAAG 2**

2.1

2.1.1 Low pressure ✓ and High temperature ✓ (2)

2.1.2



Axes –correctly label ✓ /
 Asse korrek benoem ✓
 Shape / Vorm ✓✓

(3)

$$2.1.3 \quad n = \frac{pV}{RT} = \left(\frac{V}{R}\right) \times \left(\frac{p}{T}\right) = \left(\frac{V}{R}\right) \times \text{gradient} \quad \checkmark \checkmark$$

(2)

$$2.2 \quad pV = nRT \checkmark$$

$$\therefore p = \frac{nRT}{V} = \frac{\frac{1}{32} \times 8,31 \times (273 + 80)}{500 \times 10^{-6}} = 183339 \text{ Pa} = 183 \text{ kPa} = 1,83 \text{ kPa} \quad \checkmark$$

(6)

2.3 Increase in temperature provides more kinetic energy ✓ to gas particles. Gas particles move faster ✓ and collide more frequently ✓ with the walls of the cylinder. Pressure therefore increases ✓ /

(4)

Die toename in temperatuur verskaf meer kinetiese energie ✓ aan die gasdeeltjies wat vinniger beweeg ✓ en bots meer dikwels ✓ met die wande van die silinder. Dus neem die druk toe ✓ en die deksel spring af

[17]

Question 3 / Vraag 3

- 3.1 $\text{FeS} + 2\text{HCl} \checkmark \rightarrow \text{H}_2\text{S} + \text{FeCl}_2 \checkmark$ (\checkmark balancing) (3)
- 3.2
- 3.2.1 $\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}^- \checkmark\checkmark$ (2)
- 3.2.2 $\text{SO}_4^{2-} + 4\text{H}^+ + 2\text{e}^- \rightarrow \text{SO}_2 + 2\text{H}_2\text{O} \checkmark\checkmark$ (2)
- 3.2.3 $\text{Cu} + \text{SO}_4^{2-} + 4\text{H}^+ \rightarrow \text{Cu}^{2+} + \text{SO}_2 + \text{H}_2\text{O} \checkmark\checkmark$ (2)
- 3.3 Yellow solid/sulphur \checkmark and moisture \checkmark (2)
Geel vastestof(spikkels)/swawel \checkmark en waterdamp \checkmark
- 3.4 $\text{SO}_2 + 2\text{H}_2\text{S} \checkmark \rightarrow 3\text{S}(\text{s}) + 2\text{H}_2\text{O} \checkmark$ (\checkmark balancing) (3)
- 3.5 More dense than H_2S . \checkmark / *Meer dig as H_2S* (1)
- 3.6 The rate of the reaction will be less./ The formation of the products is slower $\checkmark\checkmark$ (2)
/ Die vorming van die produkte sal stadige plaasvind/ Reaksietempo kleiner $\checkmark\checkmark$

[17]

QUESTION 4 / VRAAG 4

4.1

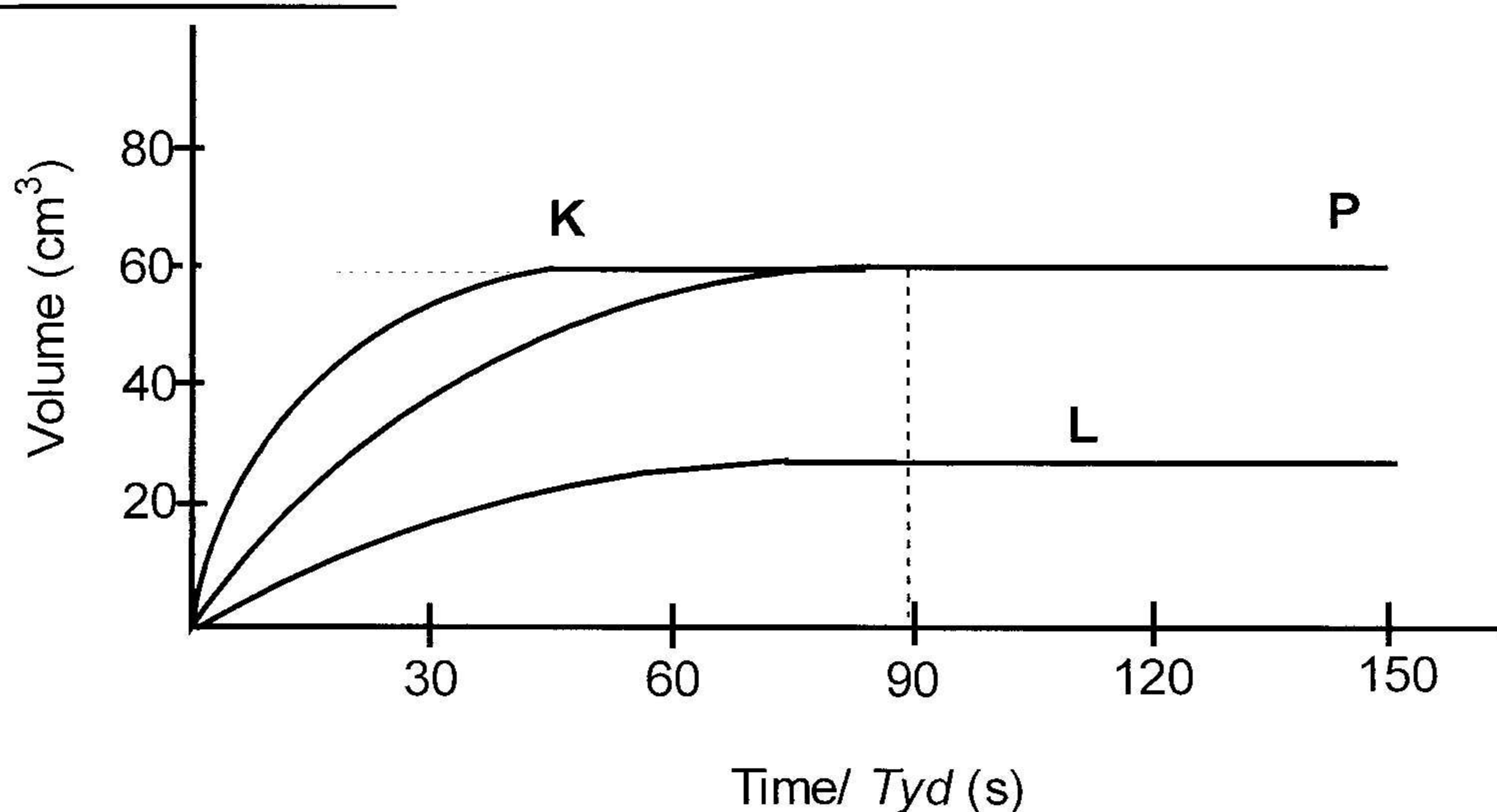
4.1.1 Dilute ✓ / Verdun ✓ (1)

4.1.2 $\text{NO}_3^- + 4\text{H}^+ + 3\text{e}^- \rightarrow \text{NO} + 2\text{H}_2\text{O}$ ✓✓ ($\approx 1/2$) (2)4.1.3 Cu^{2+} ✓✓ (2)

4.2

4.2.1 $\text{KBr} + \text{AgNO}_3 \rightarrow \text{AgBr} + \text{KNO}_3$ ✓ (✓ balancing) (3)4.2.2 Br_2 ✓✓ is formed / word gevorm. (2)4.2.3 KCl ✓✓ (2)**[12]****QUESTIONS 5 / VRAAG 5**

5.1

5.1.1 **K** steeper curve ✓ same height ✓ / *steiler kurwe ✓ dieselfde hoogte ✓* (2)5.1.2 **L** lower curve ✓ halve the height (30 cm^3) ✓ / *laer kurwe ✓ die hoogte halfpad (30 cm^3) ✓✓* (2)5.2 $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ ✓ (✓ balancing) (3)

5.3 Redox ✓ / Redoks ✓ (1)

[8]

QUESTION 6 / VRAAG 6

6.1		CO ₂	H ₂	CO	H ₂ O
	Mol initial /begin	2,0	1,0	0	0
	Mol formed / reacted / Mol gevorm / reageer	0,723	0,723	0,723	0,723
	Mol at equilibrium / Mol by ewewig	1,277 ✓	0,277 ✓	0,723 ✓	0,723
	[] at equilibrium / []by ewewig	0,64	0,14	0,36	0,36 ✓

$$K_c = \frac{[\text{CO}][\text{H}_2\text{O}]}{[\text{CO}_2][\text{H}_2]} = \frac{0,36^2}{0,64 \times 0,14} = 1,48 \quad \checkmark \quad (1,45 \text{ rounded/afgerond}) \quad (8)$$

6.2 $\Delta H < 0$ ✓ (1)

6.3 K_c decreased, therefore less products were formed, thus the reverse reaction is favoured. ✓ When T (temperature) increases, the endothermic reaction is favoured ✓ which is the reverse reaction. Thus the forward reaction is exothermic. ✓ / K_c verminder, dus minder produkte word gevorm, gevolglik is die terugwaartse reaksie bevoordeel. ✓ Indien T (temperatuur) toeneem, word die endotermiese reaksie bevoordeel ✓ wat die terugwaartse reaksie is. Dus is die voorwaartse reaksie eksotermies ✓ (3)

6.4.1 [CO] decreases ✓✓ / [CO] neem af ✓✓ (2)

6.4.2 The [H₂O] is increased. The reaction that will use / decrease the [H₂O] is favoured. ✓ Thus the reverse reaction is favoured ✓ and the [CO(g)] will decrease ✓ / Die [H₂O] word verhoog. Die reaksie wat die verhoogde [H₂O] verminder / verbruik word bevoordeel ✓ Dus word die terugwaartse reaksie bevoordeel ✓ en die [CO(g)] sal verminder ✓ (3)

6.5.1 YES ✓ / JA ✓ (1)

6.5.2 The volume is increased. ✓ No change in the number of mole at equilibrium ✓ Thus $c = n/V$ will be smaller. ✓ / Die volume word vergroot ✓ maar die getal /aantal mol by ewewig bly dieselfde ✓ Dus $c = n/V$ sal verminder ✓ (3)

[21]

QUESTION 7 /VRAAG 7

7.1.1 10^{-3} ✓✓ (2)

7.1.2 3 ✓✓ (2)

7.1.3 10^{-4} ✓✓ (2)

7.1.4 10^{-10} ✓✓ (2)

7.2

7.2.1 $\text{CO}_3^{2-} + \text{H}_2\text{O} \rightleftharpoons \text{HCO}_3^- + \text{OH}^-$ ✓ (✓ balancing) (3)

7.2.2 CO_3^{2-} and /en HCO_3^- ✓✓

H_2O and /en OH^- ✓✓ (4)

7.2.3 $n(\text{Na}_2\text{CO}_3) = \frac{m}{M} = \frac{5,3}{106} = 0,05 \text{ mol}$ ✓

□ $n(\text{HZ}) = 2 \times n(\text{Na}_2\text{CO}_3) = 0,1 \text{ mol}$

□ $c(\text{HZ}) = \frac{n}{V} = \frac{2 \times 0,05}{0,2} = 0,5 \text{ mol.dm}^{-3}$ ✓

(7)

[22]

QUESTION 8 / VRAAG 8

8.1

8.1.1 Copper / Koper. ✓✓ (2)

8.1.2 $\text{CuSO}_4 + \text{Fe} \checkmark \rightarrow \text{Cu} + \text{Fe SO}_4 \checkmark$ (2)

8.2

8.2.1 $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag} \checkmark\checkmark$ (2)

8.2.2 No / Nee (2)

8.2.3 Pt is not a strong enough ✓✓ RA to reduce Ag^+ to Ag ✓✓ (2)

OR

 Ag^+ is not a strong enough OA to oxidise Pt to Pt^{2+} *Pt is nie sterk genoeg ✓✓ RM om Ag^+ na Ag te reduseer nie ✓✓*

OF

 *Ag^+ is nie 'n sterk genoeg OM om Pt na Pt^{2+} te oksideer nie.*8.3 $E^\circ_{\text{cell}} = E^\circ_{\text{OA}} - E^\circ_{\text{RA}} \checkmark$
1,82 = $E^\circ_{\text{OA}} - (-0,40) \checkmark$
 $E^\circ_{\text{OA}} = +1,42 \text{ V} \checkmark$
Au/ $\text{Au}^{3+} \checkmark\checkmark$ (5)

8.4

8.4.1 $\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O} \checkmark\checkmark$ (2)8.4.2 $2\text{H}_2\text{O}_2 \checkmark \rightarrow 2\text{H}_2\text{O} + \text{O}_2 \checkmark$ (✓ balancing) (3)

8.4.3 Catalyst ✓✓ / Katalisator ✓✓ (2)

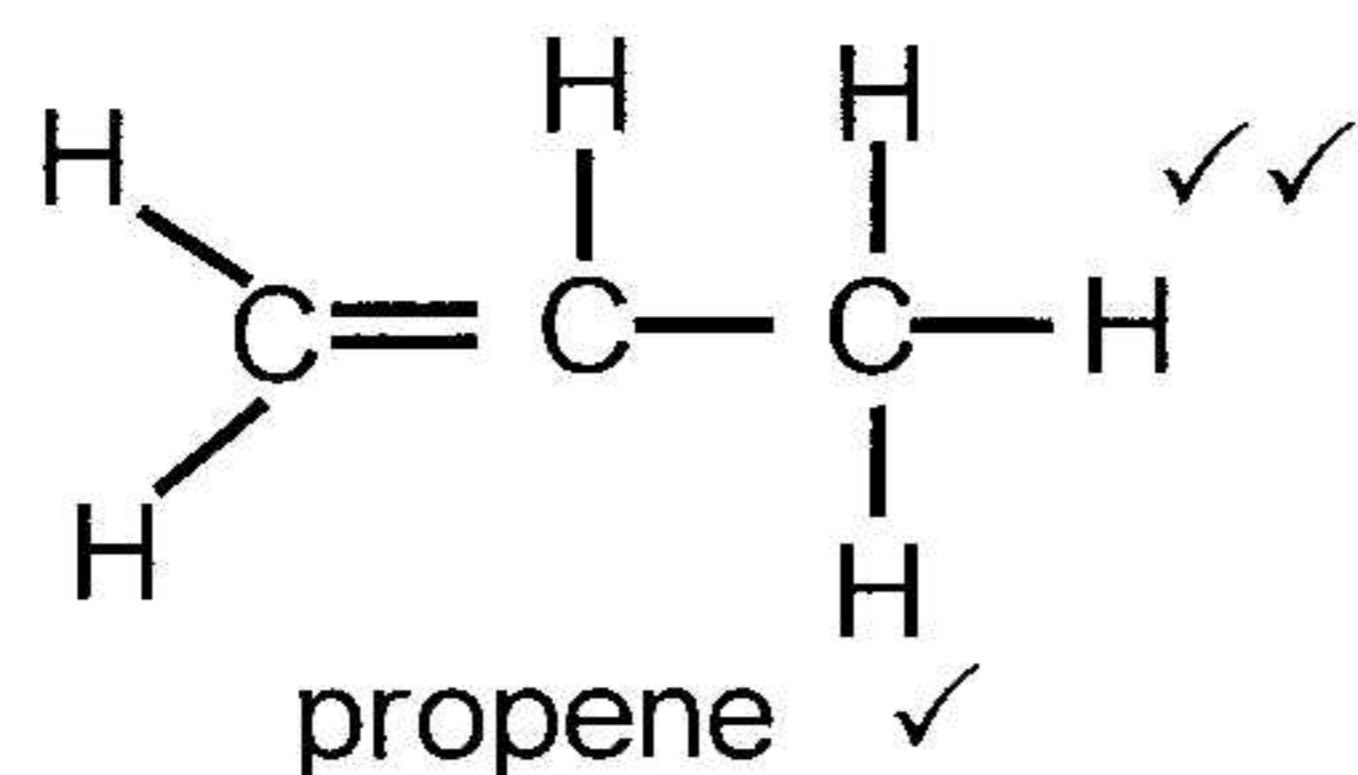
[22]

QUESTION 9 VRAAG 9

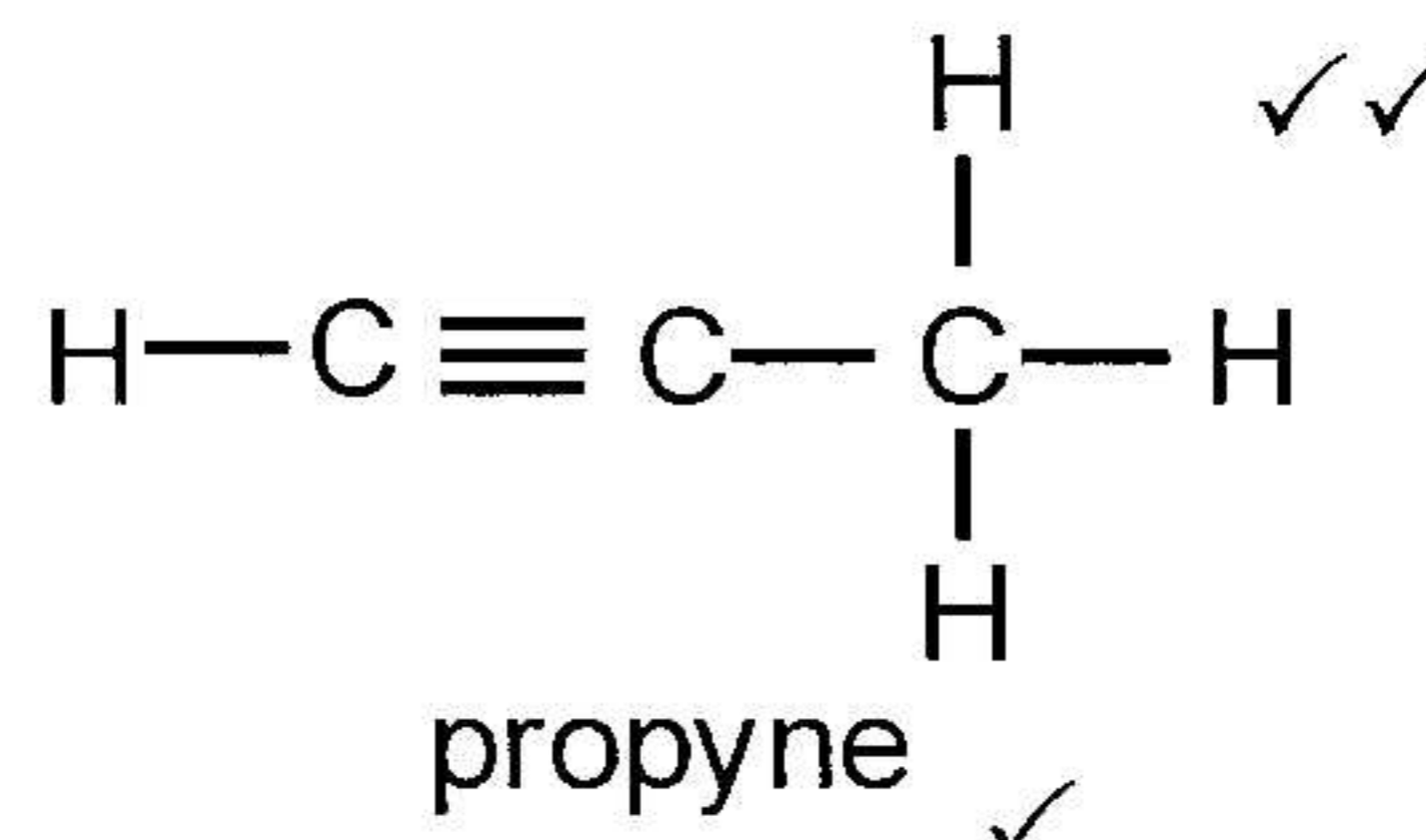
9.1

- 9.1.1 Compounds consisting of carbon ✓ and hydrogen only ✓ (2)
Verbindings wat slegs koolstof- ✓ en waterstofatome ✓ bevat

9.1.2



OR



(4)

9.2

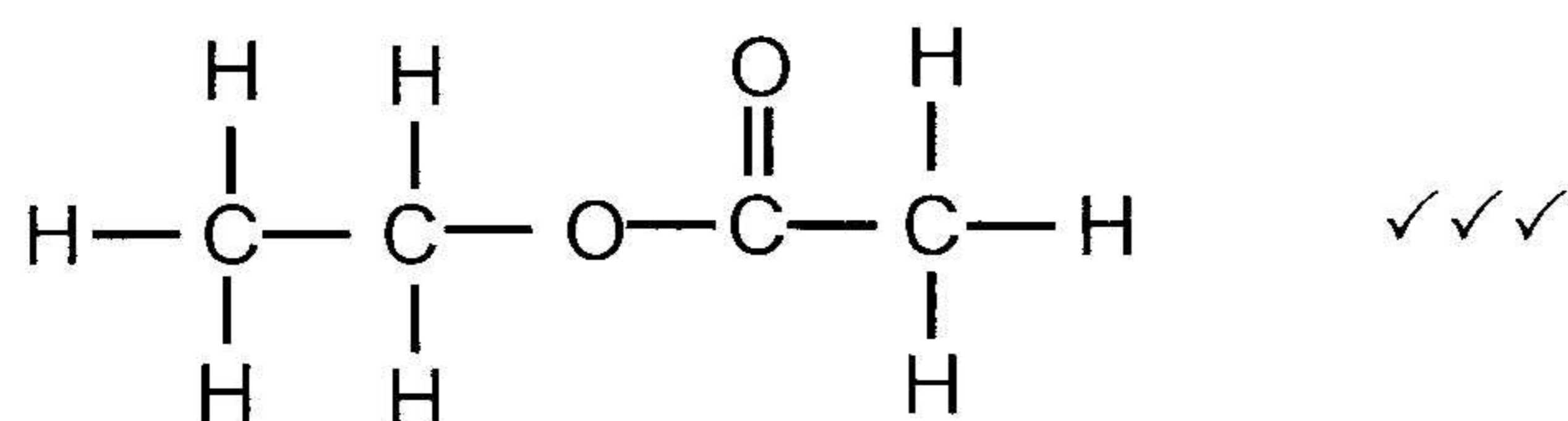
- 9.2.1 Oxidation ✓✓ / Oksidasie ✓✓ (2)

- 9.2.2 Methanoic acid and / or methanal ✓✓ (2)
Metanoësuur en / of metanaal ✓✓

9.3

- 9.3.1 esters ✓✓ / esters ✓✓ (2)

9.3.2



(3)

9.3.3



(6)

Total / Totaal [21]
[200]