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Noordwes Departement van Onderwys
North West Department of Education
NORTH WEST PROVINCE**

**NATIONAL
SENIOR CERTIFICATE
*NASIONALE
SENIOR SERTIFIKAAT***

GRADE 12/GRAAD 12

PHYSICAL SCIENCE: CHEMISTRY (P2)

FISIESE WETENSKAP: CHEMIE (V2)

SEPTEMBER 2022

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150

**These marking guidelines consist of 17 pages including the cognitive grid.
*Hierdie nasienriglyne bestaan uit 17 bladsye insluitend die kognitiewe tabel.***

QUESTION 1/VRAAG 1

1.1.	C	✓✓	(2)
1.2	C	✓✓	(2)
1.3	A	✓✓	(2)
1.4	B	✓✓	(2)
1.5	B	✓✓	(2)
1.6	D	✓✓	(2)
1.7	A	✓✓	(2)
1.8	C	✓✓	(2)
1.9	C	✓✓	(2)
1.10	D	✓✓	(2)
			[20]

QUESTION 2/VRAAG 2

2.1 3-methyl✓heptane ✓✓/3-metiel✓heptaan ✓✓

Marking criteria

- Correct stem i.e. heptane.✓
- Substituent (methyl) correctly identified.✓
- IUPAC name correct including numbering and hyphen. ✓

Nasienriglyne

- Korrekte stam bv heptaan.✓
- Sytak (metiel) korrek geïdentifiseer.✓
- IUPAC naam heeltemal korrek insluitende volgorde en koppeltekenen. ✓

(3)

2.2

2.2.1 Organic compounds having same molecular formula ✓ but different structural formula✓/Organiese verbindings met dieselde molekulêre formule✓ maar verskillende struktuurformules✓.

(2)

2.2.2 Functional isomer✓ /Funksionele isomere ✓

(1)

2.2.3 Aldehyde✓/Aldehyied ✓

(1)

2.3

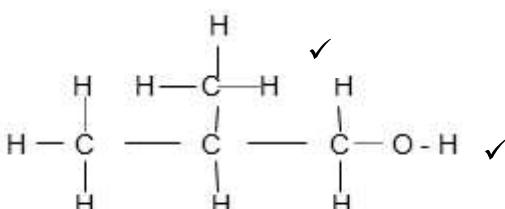
2.3.1 Secondary✓/Sekondêre ✓

(1)

2.3.2 The carbon bonded to the hydroxyl group/-OH is bonded to two other carbon atoms✓✓/Die koolstof gebind aan die hidroksielgroep/OH⁻ is gebind aan twee ander koolstofatome ✓✓

(2)

2.4



Marking criteria

- -OH on the first carbon ✓
- Whole structure correct ✓

Nasienriglyne

- -OH op die eerste koolstof ✓
- Hele struktuur korrek ✓

(2)

2.5.

2.5.1 Carboxyl group✓/Karboksielgroep ✓

(1)

2.5.2 Propanoic acid✓✓/Propanoësuur ✓✓

(2)

2.6

2.6.1 C_nH_{2n} ✓

(1)

2.6.2 CH₃CH₃ ✓

(1)

[17]

QUESTION 3/VRAAG 3:

3.1 Saturated✓/Versadig✓

No multiple bond/ single bonds only ✓ between carbon atoms in their hydrocarbon chain

Geen meervoudige bindings/slegs enkel bindings ✓ tussen die koolstofatome in die koolwaterstofketting. (2)

Marking criteria

If one of the underlined key phrases in the **correct context** is omitted deduct 1 mark

Nasienkriteria

*Indien enige van die onderstreepte frases in die **korrekte konteks** uitgelaat is, trek 1 punt af.*

3.2 Temperature at which vapour pressure is equal to the atmospheric pressure✓✓
Temperatuur waarby die dampdruk gelyk is aan die atmosferiese druk ✓✓ (2)

3.3
3.3.1 Homologous series✓/Homoloë reeks✓ (1)
3.3.2 Pentane/Hexane✓/Pentaan/Heksaan✓ (1)
3.3.3 London force/induced dipole force✓/Londonkragte/geïnduseerde dipoolkragte✓ (1)

3.3.4

(2)

3.4 Increases✓/Verhoog✓ (1)

- **Structure:**
The chain length/molecular mass increases from compound A to F✓
- **Intermolecular forces:**
The strength of the London force increase ✓
- **Energy:**
More energy needed to break the intermolecular forces from A to F✓
- **Struktuur:**
Die kettinglengte/molekulêre massa neem toe van verbinding A tot F✓
- **Intermolekulêre kragte:**
Die sterkte van die Londonkragte neem toe ✓
- **Energie:**
Meer energie word benodig om die intermolekulêrekragte van A na F te onderbreek. ✓ (4)

3.5 Higher than✓✓/Hoër as✓✓ (2)
[15]

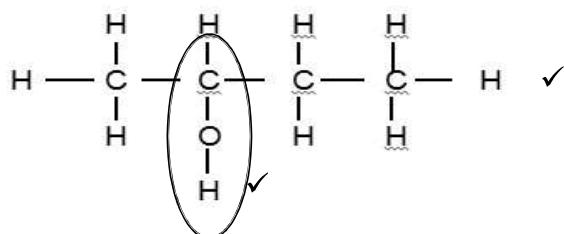
QUESTION 4/VRAAG 4:

4.1

- 4.1.1 a) Hydration✓/Hidrasie ✓
b) Hydrohalogenation✓/Hidrohalogenering ✓

(1)
(1)

4.1.2



(2)

Marking criteria:

- Four carbon atoms in longest chain✓
- Hydroxyl group on C₂✓

Nasienkriteria:

- Vier koolstowwe in die langste ketting✓
- Hydroksielgroep op C₂✓

4.1.3 2-chloro-2-methylpentane✓/2-chloro-2-metielpentaan✓

(2)

4.2

4.2.1 Substitution✓/Substitusie✓

(1)

4.2.2 NaOH/KOH/LiOH✓

(1)

4.2.3

Note:

- For QUESTIONS 4.2.3 & 4.3.2, penalise only once for the use of condensed formulae or molecular formulae

Aantekeninge:

- Vir VRAE 4.2.3 & 4.3.2, penaliseer slegs een keer vir die gebruik van gekondenseerde of molekulêre formules

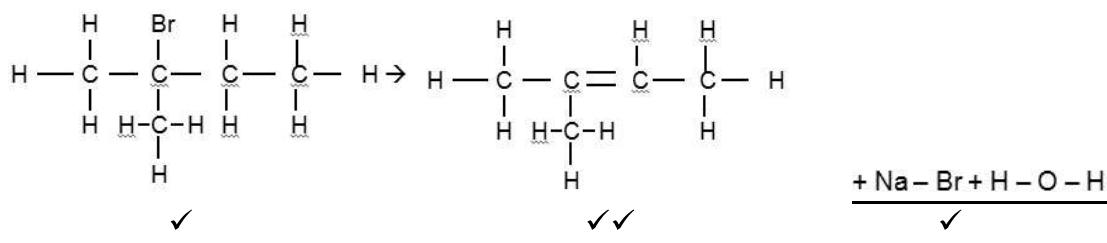
Marking criteria:

- Correct structural formula for 2-bromo-2-methylbutane✓
- Correct structural formula for 2-methylbut-2-ene✓
- Correct functional group(double bond between carbon atoms) ✓for 2-methylbut-2-ene
- Correct formula for NaBr & H₂O✓

Nasienkriteria:

- Korrekte struktuurformule vir 2-bromo-2-metielbutaan✓
- Korrekte struktuurformele vir 2-metielbut-2-een✓
- Korrekte funksionele groep(dubbelbinding tussen koolstofatome) ✓vir 2-metielbut-2-een
- Korrekte formule vir NaBr & H₂O ✓

4.2.3



4.2.4 2-methylbutan-2-ol ✓✓ / 2-metielbutan-2-ol ✓✓ (2)

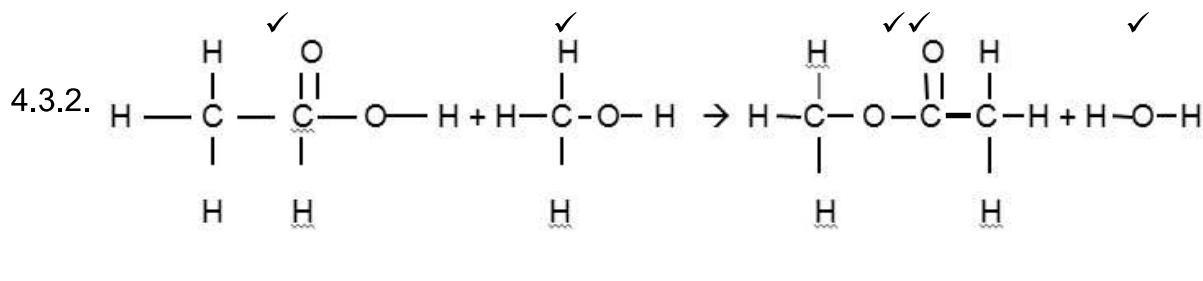
4.3.1.(Concentrated) Sulphuric acid/H₂SO₄ ✓ / (gekonsentreerde) Swawelsuur/ H₂SO₄ ✓ (1)

4.3.2 **Marking criteria:**

- Correct structural formula for ethanoic acid ✓
- Correct structural formula for methanol ✓
- Correct functional group (ester) ✓ & correct structural formula methyl ethanoate ✓
- Correct formula for H₂O ✓

Nasiekriteria:

- Korrekte struktuurformule vir etanoësuur
- Korrekte struktuurformule vir metanol
- Korrekte funksionele groep (ester) ✓ & korrekte struktuurformule metieletanoaat
- Korrekte formule vir H₂O



QUESTION 5/VRAAG 5:

5.1.

ANY ONE:

- Change in concentration ✓ of products/reactants per unit time ✓
- Change in amount/number of mole/volume/mass ✓ of products/reactants per unit time ✓
- Amount/number of mole/volume/mass of products formed/reactants used ✓ per unit time ✓
- Rate of change in concentration/amount of moles/number of moles/volume/mass ✓✓ (2 or 0)

ENIGE EEN:

- Verandering in konsentrasie ✓ van produkte/reaktante per tydseenheid ✓
- Verandering in hoeveelheid/aantal mol/volume/massa ✓ van die produkte/reaktante per tydseenheid ✓
- Hoeveelheid/aantal mol/volume/massa produkte gevorm/reaktante opgebruik ✓ per tydseenheid ✓
- Tempo van verandering in konsentrasie/aantal mol/hoeveelheid mol/volume/massa ✓✓ (2 or 0)

(2)

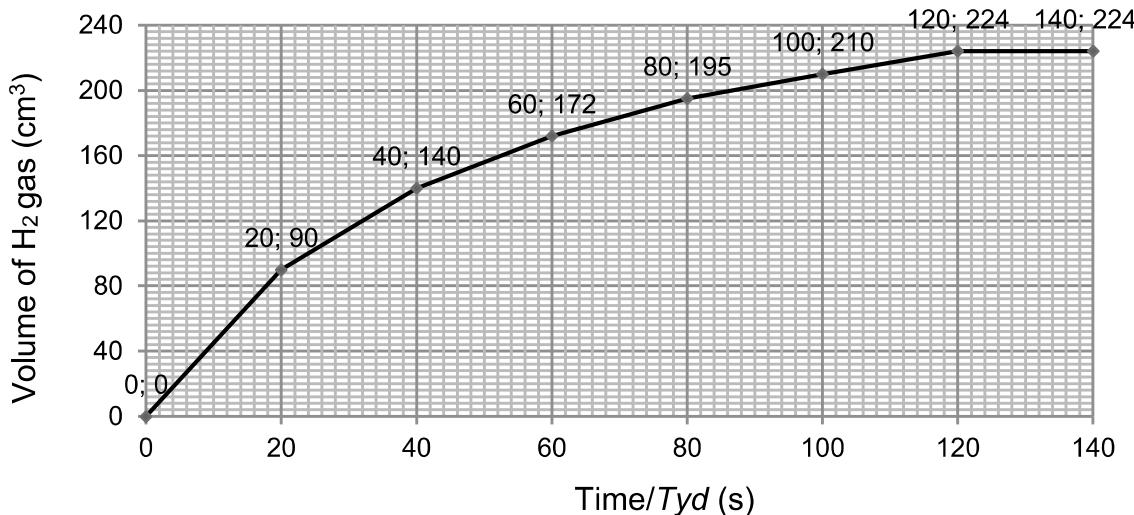
NOTE:

Give the mark for per unit time only if in correct context of reaction rate.

LET WEL:

Gee 'n punt vir per tydseenheid slegs as dit in die korrekte konteks vir reaksietempo gebruik is.

5.2.



Marking criteria/Nasiekriteria:

Plotting all the points correctly
Alle punte korrek geplot

Marks/Punte

✓✓

Shape

Vorm van die grafiek

✓✓

NOTE

If four points plotted correctly give one mark.

Aantekening

Indien vier punte korrek geplot is, gee een punt.

(4)

5.3 Rate of reaction $= \frac{\Delta v}{\Delta t} = \frac{202-156\checkmark}{90-50\checkmark} = 1,15 \text{ cm}^3 \cdot \text{s}^{-1} \checkmark$ (3)

5.4. Reactants are used up/concentration of HCl decreased \checkmark
Reaktante is opgebruik/konsentrasie van HCl het afgeneem \checkmark (1)

5.5	<p><u>Marking criteria:</u></p> <ul style="list-style-type: none"> • Substituting $24 \text{ g} \cdot \text{mol}^{-1}\checkmark$ & $2 \text{ g} \cdot \text{mol}^{-1}\checkmark$ in the correct formula • Using the ratios $\text{Mg} : \text{H}_2 = 1 : 1\checkmark$ • Final answer \checkmark <p><u>Nasienkriteria:</u></p> <ul style="list-style-type: none"> • Vervang $24 \text{ g} \cdot \text{mol}^{-1} \checkmark$ & $2 \text{ g} \cdot \text{mol}^{-1}$ in die korrekte formule • Gebruik die verhouding vir $\text{Mg} : \text{H}_2 = 1:1$ • Finale antwoord
-----	---

5.5.1 $n(\text{Mg}) = \frac{m}{M}$
 $n(\text{Mg}) = \frac{0,24}{24\checkmark} = 0,01 \text{ mol}$
 $\text{Mg} : \text{H}_2 = 1 : 1; n(\text{H}_2) = 0,01 \text{ mol} \checkmark$
 $n(\text{H}_2) = \frac{m}{M}$
 $0,01 = \frac{m}{2} \checkmark \quad m = 0,02 \text{ g} \checkmark$ (4)

5.5.2 Increase/Toeneem \checkmark (1)
[15]

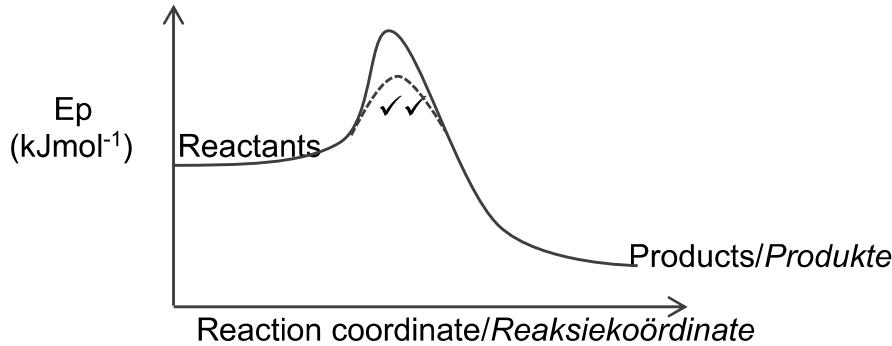
QUESTION 6/VRAAG 6:

6.1

- 6.1.1 Minimum energy needed for a reaction to take place ✓✓
Minimum energie benodig vir 'n reaksie om plaas te vind ✓✓ (2)

6.1.2 $E_a = 480 - 120, = 360(\text{kJ}\cdot\text{mol}^{-1})$ ✓ (1)

6.1.3



(2)

- 6.2.1 S ✓ (1)

- 6.2.2
- An increase temperature increases average kinetic energy of the particles✓
 - More effective collision per unit time✓
 - Rate of reaction will increase✓
 - 'n Toename in temperatuur verhoog die gemiddelde kinetiese energie van die deeltjies✓
 - Meer effektiewe botsings per tydseenheid✓
 - Reaksietempo sal toeneem✓

OR/OF

- A decrease temperature decreases the average kinetic energy of the particles✓
- Lesser effective collision per unit time✓
- Rate of reaction will decrease✓
- 'n Afname in temperatuur verlaag die gemiddelde kinetiese energie van die deeltjies✓
- Minder effektiewe botsings per tydseenheid✓
- Reaksietempo sal afneem✓

(3)

[9]

QUESTION 7/VRAAG 7:

7.1.1 When the equilibrium in a closed system is disturbed, the system will re-instate a new equilibrium by favouring the reaction that will oppose the disturbance. ✓✓ Wanneer die ewewig in 'n geslote sisteem versteur word, sal die sisteem 'n nuwe ewewig instel, deur die reaksie wat die versteuring teenwerk te bevoordeel. ✓✓ (2 or 0) (2)

7.1.2 **CALCULATIONS USING NUMBER OF MOLES**
BEREKKENINGE WAT GETAL MOL GERBUIK

Marking criteria:

- a) Calculating initial $n(H_2S)$ substitute $34\checkmark$ in the formula $n=n/M$
- b) Change in $n(S_2)$ = equilibrium $n(S_2)$ - initial $n(S_2)$ ✓
- c) Using ratio: $H_2S : H_2 : S_2 = 2: 2: 1\checkmark$
- d) Equilibrium $n(H_2) = \text{initial } n(H_2) + \text{change } n(H_2)$
Equilibrium $n(H_2S) = \text{initial } n(H_2S) - \text{change } n(H_2S)$ ✓
- e) Divide equilibrium amounts H_2S and H_2 and S_2 by $1,25 \text{ dm}^3$ ✓
- f) Correct K_c expression in square brackets ✓
- g) Substitution of equilibrium concentrations into K_c expressions ✓
- h) Final answer. $0,24\checkmark$

Nasienkriteria:

- a) Bereken die aanvanklike $n(H_2S)$ vervang $34\checkmark$ in formule $n=m/M$
- b) Verandering in $n(S_2)$ = ewewig $n(S_2)$ – aanvanklike $n(S_2)$ ✓
- c) Gebruik die verhouding: $H_2S : H_2 : S_2 = 2: 2: 1\checkmark$
- d) Ewewig $n(H_2) = \text{aanvanklik } n(H_2) + \text{verandering in } n(H_2)$
Ewewig $n(H_2S) = \text{aanvanklik } n(H_2S) - \text{verandering in } n(H_2S)$ ✓
- e) Deel ewewigswaardes van H_2S en H_2 en S_2 by $1,25 \text{ dm}^3$ ✓
- f) Korrekte K_c uitdrukking in vierkantige hakkies ✓
- g) Substitusie van ewewiskonsentrasies in die K_c uitdrukking ✓
- h) Finale antwoord: $0,24\checkmark$

OPTION 1/OPSIE 1

mol	H_2S	H_2	S_2
Initial/ Aanvanklik	$n = \frac{3,4}{34\checkmark} = 0,1$	0	0
Change / Verandering	0,074	0,074	0,037✓ ratio✓
Equilibrium/ Ewewig	0,026	0,074✓	0,037
Concentration/ Konsentrasie	$\frac{0,026}{1,25} = 0,0208$	$\frac{0,074}{1,25} = 0,0592$	$\frac{0,037}{1,25} = 0,0296$ divide by 1,25✓

$$\begin{aligned} K_c &= \frac{[H_2] \cdot [S_2]}{[H_2S]^2} \checkmark \\ &= \frac{(0,0592)^2 \times (0,0296)}{(0,0208)^2} \checkmark \\ &= 0,24 \checkmark \end{aligned}$$

CALCULATIONS USING CONCENTRATIONS BEREKENINGE WAT KONSENTRASIE GERBUIK

Marking criteria:

- Calculating initial $n(H_2S)$ substitute $34\checkmark$ in the formula $n=m/M$
- Divide initial amounts H_2S by $1,25 \text{ dm}^3\checkmark$
- Change in $c(S_2) = \text{equilibrium } c(S_2) - \text{initial } c(S_2) \checkmark$
- Using ratio: $H_2S : H_2 : S_2 = 2:2:1\checkmark$
- Equilibrium $c(H_2) = \text{initial } c(H_2) + \text{change } c(H_2)$
Equilibrium $c(H_2S) = \text{initial } c(H_2S) - \text{change } c(H_2S) \checkmark$
- Correct K_c expression in square brackets \checkmark
- Substitution of equilibrium concentrations into K_c expressions \checkmark
- Final answer. $0,24\checkmark$

Nasienkriteria:

- Bereken die aanvanklike $n(H_2S) \checkmark$ vervang 34 in die formule $n=m/M$
- Deel ewewigswaardes van H_2S by $1,25 \text{ dm}^3\checkmark$
- Verandering in $n(S_2) = \text{ewewig } n(S_2) - \text{aanvanklike } n(S_2) \checkmark$
- Gebruik die verhouding: $H_2S : H_2 : S_2 = 2:2:1\checkmark$
- Ewewig $c(H_2) = \text{aanvanklik } c(H_2) + \text{verandering in } c(H_2)$
Equilibrium $c(H_2S) = \text{initial } c(H_2S) - \text{verandering in } c(H_2S) \checkmark$
- Korrekte K_c uitdrukking in vierkantige hakkies \checkmark
- Substitusie van ewewiskonsentrasies in die K_c uitdrukking \checkmark
- Finale antwoord: $0,24\checkmark$

OPTION 2/OPSIE 2

Concentration/Konsentrasie	H_2S	H_2	S_2
Initial/ Aanvanklik	$n = \frac{3,4}{34\checkmark} = 0,1 / 1,25\checkmark = 0,08$	0	0
Change in concentrations Verandering in konsentrasie	0,0592	0,0592	$0,0296\checkmark$ ratio \checkmark
Equilibrium concentrations Ewewigskonsentrasies	0,0208	0,059 \checkmark	0,0296

$$\begin{aligned} K_c &= \frac{[H_2]^2 \cdot [S_2]}{[H_2S]^2} \checkmark \\ &= \frac{(0,0592)^2 \times (0,0296)}{(0,0208)^2} \checkmark \\ &= 0,24 \checkmark \end{aligned}$$

(8)

7.2

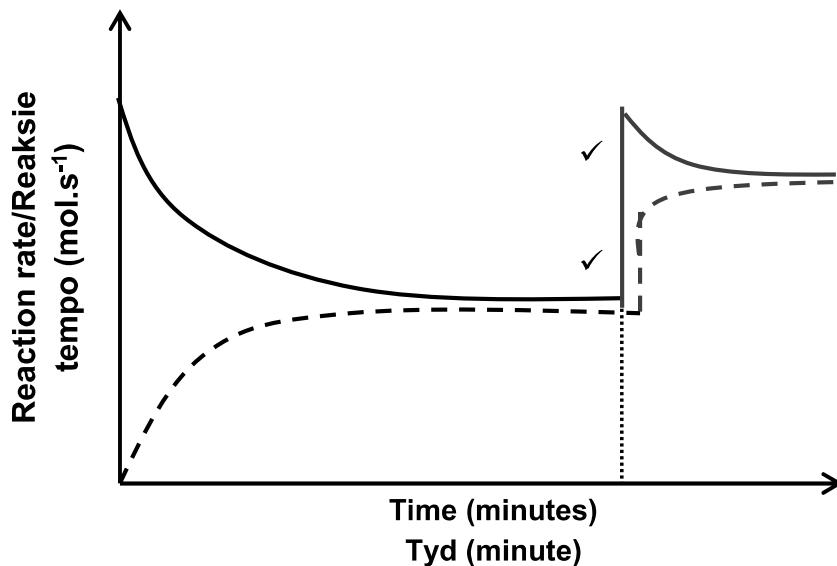
7.2.1 Endothermic✓/Endotermies ✓

(1)

7.2.2 Increase in temperature increases K_c value, and then the forward reaction is favoured✓. Increase in temperature favours endothermic reaction✓
'n Verhoging in temperatuur verhoog die K_c waarde, die voorwaartse reaksie is bevoordeel. ✓ 'n Verhoging in temperatuur bevoordeel die endotermiese reaksie✓

(2)

7.2.3



Marking criteria:

- Both lines are up✓
- Solid line is longer than dotted line✓

Nasienkriteria:

- *Beide lyne gaan op* ✓
- *Soliede lyn is langer as stippellyn* ✓

2)

[15]

QUESTION 8/VRAAG 8:

- 8.1 Weak acid ✓ It ionises incompletely/does not ionise completely in water✓ (to form a low concentration of H_3O^+)/
Swak suur✓ Dit ioniseer onvolledig/ioniseer nie volledig in water nie✓ (om 'n lae konsentrasie H_3O^+ ione te vorm)

(2)

8.2 $[\text{H}_3\text{O}^+] = [\text{HCO}_3^-] = 0,012 \text{ mol.dm}^{-3}$ ✓
 $n = cV$
 $= 0,012 \times 0,5$ ✓
 $n = 0,006 \text{ mol}$ ✓

Marking Criteria:

- Ratio $[\text{H}_3\text{O}^+] = [\text{HCO}_3^-]$ ✓
- Substitution✓ on $c = n/V$
- Answer✓

Nasienriglyne:

- Verhouding $[\text{H}_3\text{O}^+] = [\text{HCO}_3^-]$ ✓
- Substitusie✓ in $c = n/V$
- Antwoord✓

(3)

8.3

8.3.1. **Marking criteria:**

- Formula $c = n/V$ ✓
- Substitution✓
- Using ratio $1(\text{OH}^-) : 1(\text{NaOH})$ correctly ✓

Nasienriglyne:

- Formule $c = n/V$ ✓
- Substitusie✓
- Gebruik verhouding $1(\text{OH}^-) : 1(\text{NaOH})$ korrek ✓

$n_{(\text{NaOH})} = cV$ ✓

$n_{(\text{NaOH})} = 0,25 \times 0,75$ ✓
 $= 0,1875 \text{ mol}$

Therefore $n(\text{OH}^-) = 0,1875 \text{ mol}$ ✓

(3)

8.3.2 **Positive marking from 8.2 & 8.3.1/ Positiewe merk vanaf 8.2 & 8.3.1**

Marking criteria:

- Using ratio $1(\text{OH}^-) : 1(\text{HCO}_3^-)$ correctly✓ (0,006 mol of acid neutralises 0,006 mol of base)
- $n(\text{OH}^-)$ in excess $0,1875 - 0,006$ ✓ = 0,1815mol
- Substitution ✓ on $c = n/V$
- $[\text{H}_3\text{O}^+] = 10^{-14}/0,102$ ✓
- $pH = -\log [\text{H}_3\text{O}^+]$ ✓
- Substitution on formula✓
- Final answer✓

Nasienriglyne:

- Gebruik verhouding $1(\text{OH}^-) : 1(\text{HCO}_3^-)$ korrek ✓ (0,006 mol suur neutraliseer 0,006 mol basis)
- $n(\text{OH}^-)$ in oormaat $0,1875 - 0,006$ ✓ = 0,1815mol
- Substitusie ✓ on $c = n/V$
- $[\text{H}_3\text{O}^+] = 10^{-14}/0,102$ ✓
- $pH = -\log [\text{H}_3\text{O}^+]$ ✓
- Substitusie in formule✓
- Finale antwoord✓

OPTION 1/OPSIE 1

0,006 mol of acid neutralises 0,006 mol of base ✓ / 0,006 mol suur neutraliseer 0,006 mol basis ✓

$$n(OH^-) \text{ in excess/in oormaat } 0,1875 - 0,006 \checkmark = 0,1815 \text{ mol}$$
$$[OH^-] = n/V = 0,1815/(0,5+0,75) \checkmark$$

$$= 0,1452 \text{ mol.dm}^{-3}$$

$$K_w = [H_3O^+][OH^-] = 1 \times 10^{-14},$$
$$\text{therefore/dus } [H_3O^+] = 10^{-14}/0,1452 \checkmark$$
$$= 6,89 \times 10^{-14}$$

$$pH = -\log [H_3O^+] \checkmark$$

$$pH = -\log(6,89 \times 10^{-14}) \checkmark$$

$$pH = 13,16 \checkmark$$

OPTION 2/OPSIE 2

0,006 mol of acid neutralises 0,006 mol of base ✓ / 0,006 mol suur neutraliseer 0,006 mol basis ✓

$$n(OH^-) \text{ in excess/oormaat } 0,1875 - 0,006 \checkmark = 0,1815 \text{ mol}$$
$$[OH^-] = n/V = 0,1815/(0,5 + 0,75) \checkmark$$

$$= 0,1452 \text{ mol.dm}^{-3}$$

$$pOH = -\log[OH^-] \checkmark$$
$$= -\log(0,1452) \checkmark$$

$$= 0,84$$

$$pH = 14 - pOH$$

$$pH = 14 - 0,84 \checkmark$$

$$pH = 13,16 \checkmark$$

(7)
[15]

QUESTION 9/VRAAG 9:

- 9.1 Substance which accepts electron/ electron acceptors✓✓ / Stof wat elektrone opneem/ontvang✓✓ (2)
- 9.2 $X^{2+} + 2e^- \rightarrow X$ ✓✓ (2)
- 9.3 $E^\ominus_{\text{cell}} = E^\ominus_{\text{reduction}} - E^\ominus_{\text{oxidation}}$ ✓
 $0,47\checkmark = E^\ominus_{\text{cathode}} - (-0,13)\checkmark$
 $E^\ominus_{\text{cathode}} = 0,34\checkmark\checkmark$
Metal/Metaal **X** = Cu/Copper✓ / Koper✓ (5)

NOTE:

- Accept any other correct formula from the data sheet.
- Any other formula using unconventional abbreviations, e.g.
 $E^\ominus_{\text{cell}} = E^\ominus_{\text{OA}} - E^\ominus_{\text{RA}}$ followed by correct substitutions: ¾

LET WEL:

- *Aanvaar enige ander korrekte formule vanaf gegewensblad.*
- *Any other formula using unconventional abbreviations, e.g.
 $E^\ominus_{\text{cell}} = E^\ominus_{\text{OA}} - E^\ominus_{\text{RA}}$ followed by correct substitutions: ¾*

- 9.4 Pb(s)|Pb²⁺(aq)✓ ||✓ Cu²⁺(aq)|Cu (s)✓ (3)

Marking criteria/Nasienriglyne:

- Oxidation/Oksidasie ✓ Double line/Dubbellyn(||)✓
- Reduction/Reduksie✓
- Ignore the phases/Ignoreer fases

- 9.5 Less than 0.47 V✓ / Minder as 0.47 V✓
As the reaction proceeds/Soos die reaksie voortgaan
- [Pb²⁺] increases and [Cu²⁺] decreases✓ / [Pb²⁺] verhoog en [Cu²⁺] verlaag✓
 - reverse reaction is favoured✓ / terugwaartse reaksie is bevordeel✓
- (3)
[15]

QUESTION 10/VRAAG 10:

ANY ONE: (2 or 0)

10.1

- Process in which electrical energy is converted to chemical energy ✓✓
- Process in which electric current flows through an electrolyte ✓✓

ENIGE EEN: (2 or 0)

- Proses waar elektriese stroom deur 'n elektrolyt vloei ✓✓
- Proses waar elektriese energie omgeskakel word in chemiese energie ✓✓

(2)

10.2

Copper Sulphate/CuSO₄ ✓ **Accept** : Copper ions/Cu²⁺
Kopersultaat/ CuSO₄ ✓ **Aanvaar**: Koperione/Cu²⁺

(1)

10.3

Cathode/Katode✓



(3)

10.4

Ag(s) is a weaker reducing agent ✓ than Cu(s) ✓ and will therefore not be able to reduce cu²⁺(aq) to Cu(s) ✓ / Ag(s) is 'n swakker reduseermiddel ✓ as Cu(s) ✓ en sal dus nie Cu²⁺ na Cu reduseer nie. ✓

OR/OF

Cu(s) is a stronger reducing agent ✓ than Ag(s) ✓ and will therefore not be able to reduce cu²⁺(aq) to Cu(s) ✓ / Cu(s) is 'n sterker reduseermiddel ✓ as Ag(s) ✓ en sal dus nie Cu²⁺ na Cu reduseer nie. ✓

(3)
[9]

TOTAL/TOTAAL: 150