



Province of the
EASTERN CAPE
EDUCATION

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REPUBLIC OF SOUTH AFRICA

**CHIEF DIRECTORATE – CURRICULUM MANAGEMENT
HOOFDIREKTORAAT – KURRIKULUM BESTUUR**

**GRADE 12 LEARNER SUPPORT PROGRAMME
GRAAD 12 LEERDER ONDERSTEUNINGSPROGRAM**

**REVISION AND REMEDIAL TEACHING INSTRUMENT:
ANSWERS
HERSIENING EN REMEDIËRENDE ONDERRIG
INSTRUMENT:
ANTWOORDE**

**SUBJECT: PHYSICAL SCIENCES – SECOND PAPER
VAK: FISIESTE WETENSKAPPE – TWEDE VRAESTEL**

June/Junie 2009

**This document consists of 8 pages.
Hierdie dokument bestaan uit 8 bladsye.**

***Strictly not for test/examination purposes.
Streng gesproke nie vir toets-/eksamendoeleindes nie.***

SECTION A/AFDELING A
QUESTION 1: ONE-WORD ITEMS/VRAAG 1: EEN WOORD ITEMS

- | | | |
|-----|--|------------|
| 1.1 | Elimination/ <i>Eliminasie</i> ✓ | (1) |
| | | 2.1 |
| 1.2 | Cracking/ <i>Kraking</i> ✓ | (1) |
| | | 2.1 |
| 1.3 | Catalyst/ <i>Katalisator</i> ✓ | (1) |
| | | 2.1 |
| 1.4 | Heat of Reaction/ <i>Reaksiewarmte</i> ✓ | (1) |
| | | 2.1 |
| 1.5 | Redox reaction/ <i>Redoksreaksie</i> ✓ | (1) |
| | | 2.1 |
| | | [5] |

QUESTION 2: FALSE ITEMS/VRAAG 2: ONWAAR ITEMS

- | | | |
|-----|---|-------------|
| 2.1 | Benzene is unsaturated/ <i>Benseen is onversadig</i> ✓✓ | (2) |
| | | 2.1 |
| 2.2 | An amide is formed when a carboxylic acid and an amine react./
<i>'n Amied vorm wanneer 'n karboksielsuur met 'n amien reageer.</i> ✓✓ | (2) |
| | | 2.1 |
| 2.3 | A catalyst reduces the activation energy/
<i>'n Katalisator verminder die aktiveringsenergie.</i> ✓✓ | (2) |
| | | 2.1 |
| 2.4 | The amount of product does not change./ <i>Die hoeveelheid produkte bly onveranderd.</i> ✓✓ | (2) |
| | | 2.2 |
| 2.5 | It is the oxidizing agent./ <i>Dit is die oksideermiddel</i> ✓✓. | (2) |
| | | 2.1 |
| | | [10] |

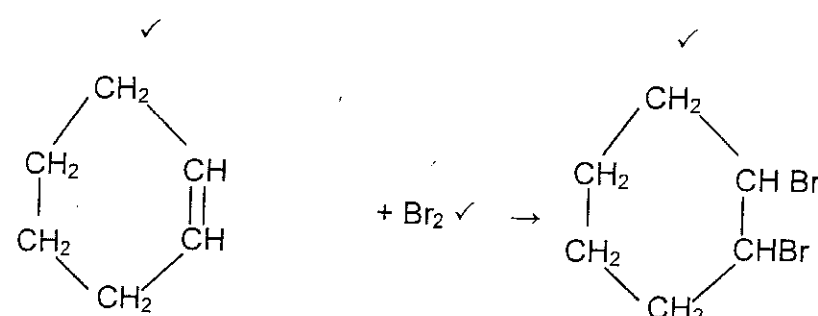
**QUESTION 3: MULTIPLE-CHOICE QUESTIONS/
VRAAG 3: MEERVOUDIGEKEUSE-VRAE**

- | | | |
|-----|------|-------------|
| 3.1 | A ✓✓ | (2) |
| | | 2.3 |
| 3.2 | B ✓✓ | (2) |
| | | 2.3 |
| 3.3 | C ✓✓ | (2) |
| | | 2.2 |
| 3.4 | D ✓✓ | (2) |
| | | 2.1 |
| 3.5 | B ✓✓ | (2) |
| | | 2.3 |
| | | [10] |

TOTAL SECTION/TOTAAL AFDELING A: 25

SECTION B/AFDELING B

QUESTION 4/VRAAG 4

- 4.1 Which substance is more reactive cyclohexane or cyclohexene?/
Watter stof is meer reaktief sikloheksaan of siklohekseen? ✓✓ (2)
- 4.2 Temperature/Temperatuur ✓✓ 1.1 (2)
- 4.3 Cyclohexene is more reactive than cyclohexane./ OR
Siklohekseen is meer reaktief as sikloheksaan. ✓✓ OF
Cyclohexane is more reactive than cyclohexene./
Sikloheksaan is meer reaktief as siklohekseen. (2)
- 4.4 4.4.1 No reaction/Nothing/
Geen reaksie/Niks ✓✓ 1.1 (2)
- 4.4.2 Bromine decolourizes/Broom ontkleur. ✓✓ 1.2 (2)
- 4.5 Cyclohexene reacts with the bromine./
Siklohekseen reageer met broom. ✓✓ (2)
- 4.6  (3) 2.3
- 4.7 Addition/Addisie ✓✓ (2)
- 4.8 1,2-dibromo-cyclohexane/1,2-dibromo-sikloheksaan ✓✓ 2.1 (2)
- 4.9 Cyclohexene is more reactive than cyclohexane/
Siklohekseen is meer reaktief as sikloheksaan. ✓✓ 2.2 (2)

[21]

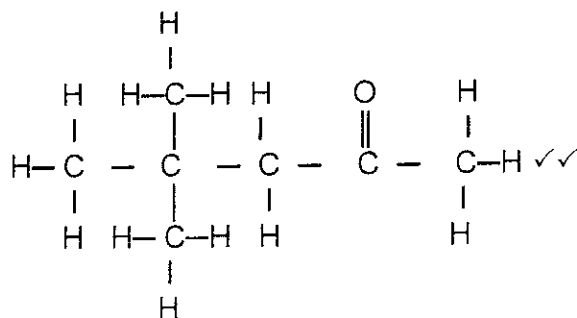
QUESTION 5/VRAAG 5

- 5.1 Oxidation/Oksidasie (2)
 Fermentation/Fermentasie ✓✓ 3.3
- 5.2 Vinegar/Asyn ✓✓ (2)
 3.2
- 5.3 Blindness or Death/Blindheid of Dood ✓✓ (2)
 3.3
- 5.4 Welding industry/Sweiswerkbedryf ✓✓ (2)
 3.2
- 5.5 $2 \text{C}_2\text{H}_2 + 5 \text{O}_2 \checkmark \rightarrow 4 \text{CO}_2 + 2 \text{H}_2\text{O} \checkmark$ (Bal ✓) (3)
 2.3
- 5.6 Margarine/Margarien ✓✓ (2)
 3.2
- [13]

QUESTION 6/VRAAG 6

- 6.1 6.1.1 C ✓✓ (2)
 2.1
- 6.1.2 D ✓✓ (2)
 2.1
- 6.1.3 A, E ✓✓ (2)
 2.1
- 6.1.4 F ✓✓ (2)
 2.1
- 6.1.5 H ✓✓ (2)
 3.2
- 6.2 $\text{C}_2\text{H}_6 + \text{Br}_2 \checkmark \rightarrow \text{C}_2\text{H}_5\text{Br} + \text{HBr} \checkmark$ (Bal ✓) (3)
 2.3

6.3



(2)
 2.3
 [15]

QUESTION 7/VRAAG 7

7.1 Thermometer/Termometer ✓✓ (2)

7.2 To measure the temperature/Om die temperatuur te meet. ✓✓ 1.1

7.3 DECREASE ✓ (2)

Beaker feels cool OR
Energy absorbed/taken in OR
Energy (products) more than Energy (reagents) ✓✓/

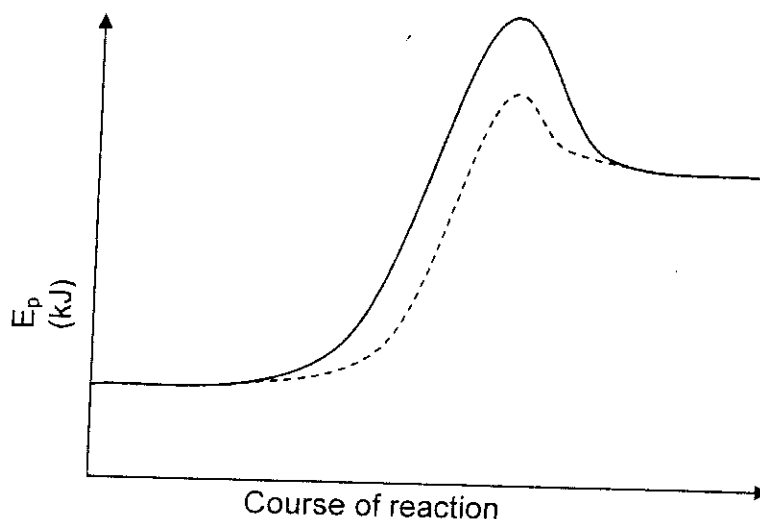
NEEM AF
Beker voel koel OF
Energie geabsorbeer/ingeneem OF
Energie (produkte) meer as Energie (reagense) (3)

7.4 50 kJ ✓✓ 1.2

7.5 $\Delta H = E(\text{prod}) - E(\text{reagents})$ ✓
= 170 - 50
= 120 kJ ✓ 1.2

7.6 Activation Energy/Aktiveringsenergie = 200 - 50 = 150 kJ ✓ (4)

7.7 (3)



7.8 7.8.1 Remain the same/Bly dieselfde ✓✓ 1.2

7.8.2 Decreases/Neem af ✓✓ 1.2

7.8.3 Remain the same/Bly dieselfde ✓✓ 1.2

QUESTION 8/VRAAG 8

- 8.1 Carbon dioxide/*Koolstofdioksied* ✓✓ (2)
2.1
- 8.2 Rate = m/t ✓
= $\frac{0,5}{3}$ ✓
= $0,17 \text{ g}\cdot\text{s}^{-1}$ ✓ (3)
2.3
- 8.3 Increase the concentration of vinegar/*Verhoog konsentrasie van asyn* ✓✓
Heat up the mixture/*Verhit die mengsel* ✓✓
Add suitable catalyst/*Voeg geskikte katalisator by* ✓✓
ANY TWO/ENIGE TWEE (4)
3.2
- 8.4 Increases the surface area/*Verhoog die reaksieoppervlak* ✓✓ (2)
3.2
[11]

QUESTION 9/VRAAG 9

- 9.1 Haber process/*Haberproses* ✓✓ (2)
2.1
- 9.2 Removing ammonia decreases ammonia concentration in the system and thus the equilibrium shifts towards the right. ✓✓
Thus more ammonia is formed. ✓✓
Verwydering van ammoniak verlaag ammoniak konsentrasie in die sisteem en die ewewig verskuif na regs ✓✓
Daarom word meer ammoniak gevorm. ✓✓ (4)
2.3
- 9.3 Less in the same time ✓✓ / *Minder in dieselfde tyd* ✓✓ (2)
2.3
- 9.4 To increase the yield of ammonia OR shift equilibrium to product. ✓✓
Om die opbrengs van ammoniak te verhoog OF verskuif ewewig na produk (2)
2.3
- 9.5
$$K_c = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$$

= $\frac{2^2}{(0,5) \times 1^3}$
= 8 ✓
Option 2 / *Opsie 2*
is better ✓ / *is beter*
- | | N ₂ | H ₂ | NH ₃ | |
|---|----------------|----------------|-----------------|---|
| Initial/
<i>Aanvanklik</i> | 1,5 | 4 | 0 | ✓ |
| Reacted(change)/
<i>Reageer/verander</i> | 1✓ | 3✓ | 2 | |
| At equilibrium/
<i>By ewewig</i> | 0,5 | 1 | 2 | ✓ |
- (8)
1.3

Alternative approach to QUESTION 9.5 using moles

	N ₂	H ₂	NH ₃	
Initial/ <i>Aanvanklik</i>	3	8	0	✓
Reacted(change)/ <i>Reageer/verander</i>	2	6	4	✓
Moles At equilibrium/ <i>Mol By ewewig</i>	1	2	4	✓
Con. At equilibrium/ <i>Kon. By ewewig</i>	0,5	1	2	✓

QUESTION 10/VRAAG 10

[18]

- 10.1 Sodium hydroxide/Natriumhidroksied ✓✓ (2)
- 10.2 $2 \text{H}_2\text{O} + 2 \text{e}^- \rightarrow \text{H}_2 + 2 \text{OH}^-$ ✓ (2.3)
- 10.3 $2 \text{Cl}^- \rightarrow \text{Cl}_2 + 2 \text{e}^-$ ✓✓ (2.3)
- 10.4 $2 \text{Cl}^- + 2 \text{H}_2\text{O} \rightarrow \text{Cl}_2 + \text{H}_2 + 2 \text{OH}^-$ ✓ (Bal ✓) (2.3)
- 10.5 ANY ONE (3)
- As a disinfectant ✓✓ (2)
- In the manufacturing of PVC pipes ✓✓ (3.2)
- As a bleaching agent ✓✓ (3.2)
- ENIGE EEN*
- As ontsmettingsmiddel (2)
- In vervaardiging van PVC-pype (3.2)
- As bleikmiddel (3.2)

[11]

QUESTION 11/VRAAG 11

- 11.1 11.1.1 Iron/Yster ✓✓ (2)
1.1
- 11.1.2 Magnesium, Zinc, Aluminium, Any reducing agent stronger than iron/
Magnesium, Sink, Aluminium, Enige reduseermiddel sterker as yster ✓✓ (2)
1.1
- 11.2 11.2.1 Iron/Yster ✓✓ (2)
2.3
- 11.2.2 $Zn \rightarrow Zn^{2+} + 2e^-$ ✓✓ (2)
2.3
- 11.3 A stronger reducing agent becomes oxidized preventing the iron from being oxidized. ✓✓
OR Fe^{2+} is reduced by the Zn. ✓✓/
- 'n Sterker reduseermiddel word geoksideer en verhoed dat yster oksideer word OF Fe^{2+} word gereduseer deur Zn.* (2)
2.3
- 11.4 Rusting/Verroesting ✓✓ (2)
3.3
[12]

TOTAL SECTION/TOTAAL AFDELING B: 125

GRAND TOTAL/GROOTTOTAAL: 150