



Auxilio

DISTANCE EDUCATION

GRAAD 12 /
GRADE 12

FISIESE WETENSKAP /
PHYSICAL SCIENCE

MEMORANDUM.

JUNIE EKSAMEN /
JUNE EXAMINATION

VRAESTEL 2 /
PAPER 2

GRAAD / GRADE 12

FISIESE WETENSKAPPE / PHYSICAL SCIENCES

KWARTAAL 2 / TERM 2

JUNIE EKSAMEN / JUNE EXAM

VRAESTEL / PAPER 2

MEMORANDUM

MERK RIGLYNE / MARKING GUIDELINES

VRAAG / QUESTION 1 (20)

1.1	1.2	1.3	1.4	1.5
D $\checkmark\checkmark$	A $\checkmark\checkmark$	D $\checkmark\checkmark$	C $\checkmark\checkmark$	A $\checkmark\checkmark$
1.6	1.7	1.8	1.9	1.10
C $\checkmark\checkmark$	B $\checkmark\checkmark$	D $\checkmark\checkmark$	C $\checkmark\checkmark$	C $\checkmark\checkmark$

[10 X 2= 20]

VRAAG / QUESTION 2: (15)

2.1 (2)

Versadige koolwaterstof het slegs enkelbindings tussen koolstof atome. $\checkmark\checkmark$

OR

Die koolstof atoom is verbind aan die maksimum aantal waterstof atome $\checkmark\checkmark$

Saturated hydrocarbon has only single bonds between carbon atoms. $\checkmark\checkmark$

OR

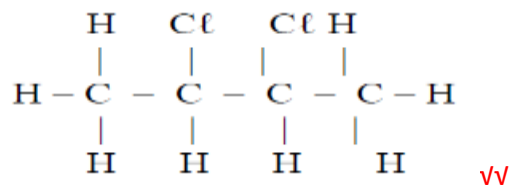
The carbon atom is linked to the maximum number of hydrogen atoms $\checkmark\checkmark$

2.2.1 (2)

$\text{CH}_3\text{C}(\text{CH}_3)\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$ $\checkmark\checkmark$

(2)

2.2.2



2.3.1

BvV

(2)

2.3.2

A,E,F (Enige twee /Any two vV)

(2)

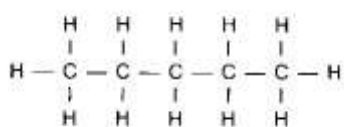
2.3.3

Haloalkane / Alkielhalied Haloalkanes v

(1)

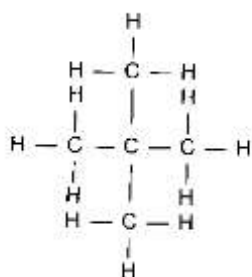
2.3.4

(4)



n-pentaan

2,2-dimetielpropaan / 2,2 dimethylpropane vV



Dimetielpropaan / Dimethylpropane vV

[15]

VRAAG / QUESTION 3: (23)

3.1

3.1.1 A – substitusie /halogenering // substitution / halogenation v

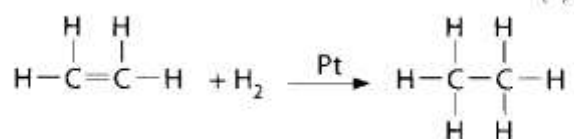
B – addisie /hidrogenering // addition / hydrogenation v

D – eliminasie/ dehidrasie // elimination / dehydration v

H – substitusie / hidrohalogenering // substitution / hydrohalogenation v

3.1.2

(4)



EEN punt vir elke reagens en produk / ONE mark for every reactant and product vV

(3)

3.1.3

HBr of waterstofbromied // HBr or hydrogenbromide ✓

3.1.4.1

F eliminasie/ dehidrohalogenering // elimination / dehydrohalogenation ✓✓ (1)

3.1.4.2

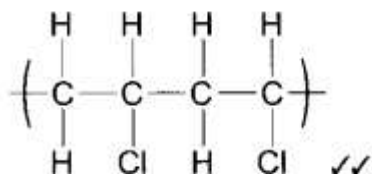
G Substitusie / substitution ✓✓ (2)

3.1.4.3

Albei is 'n sterk basis ✓ maar in F is die basis gekonsentreerd ✓✓ en G is dit verdun ✓✓ (2)

Both are a strong base ✓ but the base is concentrated in F ✓✓ and diluted in G ✓✓

3.2.1



3.2.2

Addisie polimerisasie / addition polimerisation ✓ (2)

3.2.3

Polimeer bestaan uit 'n groot aantal struktuur eenhede of monomere ✓✓ (1)

'n Monomeer is die basiese eenheid waaruit die polimeer opgebou is ✓✓

Polymer consists of a large number of structure units or monomers ✓✓

A monomer is the basic unit from which the polymer is built ✓✓

(4)

[23]

VRAAG / QUESTION 4: (14)

4

4.1.1 Alkane / alkanes ✓

(1)

4.1.2 Kettingisomere / Chain isomeres ✓✓

(2)

4.2.1 Vertakking / branching ✓

(1)

4.2.2 Vertakking, molekule minder kompak, groter oppervlakte waaroor kragte werk ✓

Sterker geïnduseerde dipool kragte (London/dispersiekragte) ✓

Meer energie nodig om die IMK te oorkom ✓

Branching, molecules less compact, larger area over which forces work ✓

More induced dipole forces (London / dispersion forces) ✓

Need more energy to overcome the IMF ✓

(3)

4.2.3 B, ✓ laagste KP en $KP \propto 1 / DD$ ✓✓

B. ✓ lowest BP and $BP \propto 1 / DP$ ✓✓

(3)

4.2.4 Compound C : ✓
Dipole-dipole kragte / Dipole – dipole forces

Compound E : ✓
Geïnduseerde dipool kragte / London / Dispersie ✓
induced dipole forces (London / dispersion forces)

4.3 Die waterstofbinding tussen molekule van E ✓ is sterker as die dipool-dipool kragte tussen molekule van D ✓ // The hydrogen bond between molecules of E ✓ is stronger than the dipole-dipole forces between molecules of D ✓

(2)
(2)
[14]

VRAAG / QUESTION 5: (17)

5

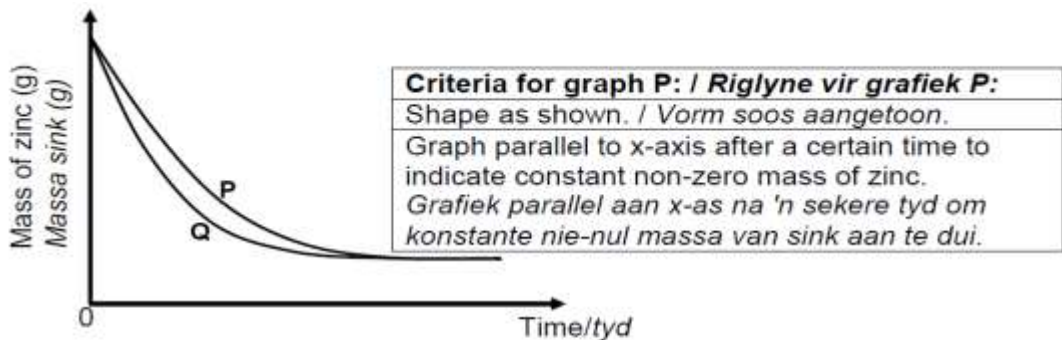
5.1 HCl of soutsuur // hydrochloric acid ✓✓

(2)

5.2 Waterstofgas (H₂(g)) ✓ ontsnap ✓ uit die fles // Hydrogen gas ✓ evaporates from the flask ✓

(2)

5.3 Asse / Axis ✓



✓
✓

5.4

Criteria for graph Q / Riglyne vir grafiek Q:	
Steeper gradient than Graph P. / Steiler gradiënt as Grafiek P.	
Joins parallel section of Graph P after a shorter time. / Verbind met die parallelle deel van Grafiek P na 'n korter tyd.	✓

(1)

5.5 Hoe hoër die temperatuur hoe hoër die kinetiese energie en hoe vinniger beweeg die deeltjies. ✓
Dus is daar meer effektiewe, reg georiënteerde botsings per tydseenheid. ✓
Meer botsings met kinetiese energie hoër as aktiverings energie. ✓

The higher the temperature, the higher the kinetic energy and the faster the particles move ✓
So there are more effective, correctly-oriented collisions per unit of time ✓
More collisions with kinetic energy higher than activation energy ✓

(3)

5.6 $c = n/V$ ✓

Uit gebalanseerde vergelyking / From the balanced equation

2 mol HCl : 1 mol Zn // 2 moles of HCl: 1 mol of Zn

$$0,2 = n/0,1 \text{ . } \checkmark$$

Dus sal 0,02 mol HCl 0,01 mol Zn benodig / So 0.02 mole of HCl will need 0.01 mole of Zn. ✓

$$n = 0,02 \text{ mol HCl}$$

$$n = m/M \checkmark$$

$$0,01 = m/65 \checkmark$$

$$m = 0,65 \text{ g Zn}$$

Oorspronklike massa //Original mass Zn is $0,65 + 0,12 = 0,77 \text{ g}$ ✓ (6)

[17]

VRAAG / QUESTION 6: (21)

6

6.1 In 'n geslote/geïsoleerde sisteem is die tempo van die voorwaartse en terugwaartse reaksies dieselfde. ✓✓

In a closed / isolated system, the rate of forward and reverse reactions is the same ✓✓

(2)

6.2.1 Afneem / Decrease ✓✓

(2)

6.2.2 Afneem // Decrease ✓✓

(2)

6.2.3 Afneem // Decrease ✓✓

(2)

6.3.1 Die reaksie is eksotermies dus sal 'n temperatuur verhoging die terugwaartse reaksie bevoordeel ✓, maar 'n temperatuur verlaging gaan die reaksie tempo verlaag al word die voorwaartse reaksie bevoordeel ✓

'n Kompromie tussen die twee word verkry. ✓

The reaction is exothermic so a temperature increase will favor the reverse reaction ✓,

but a temperature reduction will lower the reaction rate even if the forward reaction is favored ✓

A compromise between the two is obtained. ✓

(3)

6.3.2 Toeneem, ✓

Volgens Le Chatelier bevoordeel hoër druk reaksie wat minste mol vorm ✓

Dus sal verhoogde druk die voorwaartse reaksie bevoordeel ✓ en die opbrengs van SO₃ verhoog

Increase, ✓

According to Le Chatelier, higher pressure favours reaction that produces at least mole ✓

Thus, increased pressure will favour the forward reaction ✓ and the yield of SO₃ will increase.

(3)

6.4.1 $K_c = [SO_3]^2/[SO_2]^2[O_2]$ ✓✓

$$= (0,2/2)^2 \checkmark \checkmark / (0,2/2)^2 (0,4/2) \checkmark$$

$$= 5 \checkmark$$

(punt vir bepaling van c / mark for calculation of c)

(5)

- 6.4.2 Geen invloed (want katalisator beïnvloed slegs reaksietempo) //
 No influence (because catalyst only affects reaction rate) ✓✓

(2)
 [21]

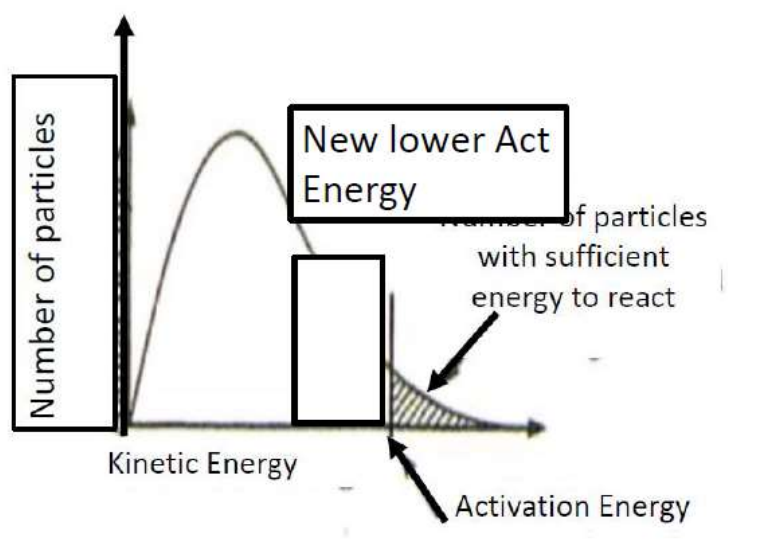
VRAAG / QUESTION 7 (13)

7

- 7.1 Bindings✓ (intra en intermolekulêre) moet oorkomword voordat atome weer effektief ✓ sal bots om nuwe bindings te vorm. / Forces ✓ (intra and intermolecular) must be overcome before atoms will again collide effectively to form new bonds ✓.

(2)

7.2



✓✓

(2)

- 7.3 Aktiveringsenergie word minder – dus meer deeltjies✓ in die geaktiveerde kompleks✓ waar hulle oor genoeg kinetiese energie✓ beskik sodat botsings effektief✓ is en nuwe bindings kan vorm✓.

Activation energy becomes less - thus more particles ✓ in the activated complex ✓ where they have enough kinetic energy ✓ so that collisions are effective✓ and can form new bonds ✓

(5)

- 7.4 Temperatuur $\propto E_k$ (gem) ✓✓. Dus hoe laer die E_k van die deeltjies hoe minder effektiewe botsings ✓ is daar wat minder bindings tot gevolg het wat tempo van bederf laat afneem✓.

Temperature $\propto I$ (gem) ✓.✓. So the lower the E_k of the particles, the less effective collisions ✓. there are that result in fewer bonds that slow down the rate of decay ✓..

(4)

[13]

VRAAG / QUESTION 8 (13)

8

8.1 Geslote sisteem / Closed system ✓ (1)

8.2

8.2.1 Oranje / Orange. ✓ (1)

8.2.2 $K_c = [\text{Cr}_2\text{O}_7^{2-}] / [\text{CrO}_4]^{2-}[\text{H}^+]^2$ ✓ ✓ (2)

8.2.3 Minder produkte ✓, terugwaartse reaksie bevoordeel, ✓ K_c minder ✓ / Less product ✓; reverse reaction benefit ✓; K_c decrease ✓ (3)

8.3.1 Oranje / Orange ✓. (1)

8.3.2 Volgens Le Chatelier bevoordeel meer OH^- ✓. die vorming van H_2O ✓. dus voorwaarts reaksie ✓. ✓. bevoordeel. Kleur verander na Oranje ✓.

According to Le Chatelier, more OH^- ✓ forms more H_2O ✓ Thus forward reaction benefit ✓. ✓. Colour changes to orange. ✓

(5)
[13]

VRAAG / QUESTION 9 (8)

9

$$\begin{aligned} K_c &= \frac{[\text{AB}_2]^2 \cdot [\text{B}_2]}{[\text{AB}_3]^2} \\ &= \frac{(3)^2 \cdot (1.5)}{(2)^2} \\ &= 3.38 \end{aligned}$$

(8)

VRAAG / QUESTION 10 (6)

10

10.1 Eksotermies / Exothermic . ✓ ΔH neg / < 0 ✓ (2)

10.2.1 GROTER AS / FASTER than ✓
Helling steiler / Gradient steeper ✓ (2)

10.2.2 GELYK AAN / EQUAL than ✓
Ewewig / Equilibrium ✓ (2)
[6]

TOTAAL / TOTAL **150**