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 √√	A √√	D √√	C √√	A √√
1.6	1.7	1.8	1.9	1.10
C √√	B √√	D √√	C √√	C √√

[10 X 2= 20]

VRAAG / QUESTION 2: (15)

2.1 (2)

Versadige koolwaterstof het slegs enkelbindings tussen koolstof atome. √√
OF
Die koolstof atoom is verbind aan die maksimum aantal waterstof atome √√

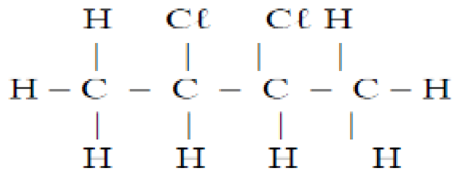
Saturated hydrocarbon has only single bonds between carbon atoms. √√
OR
The carbon atom is linked to the maximum number of hydrogen atoms √√

2.2.1 (2)

$CH_3\ C\ (CH_3)\ C\ (CH_3)\ CH_2\ CH_3$ √√

(2)

2.2.2



√√

2.3.1 (2)

B√√

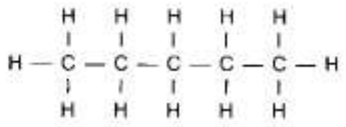
2.3.2 (2)

A,E ,F (Enige twee /Any two√√)

2.3.3 (1)

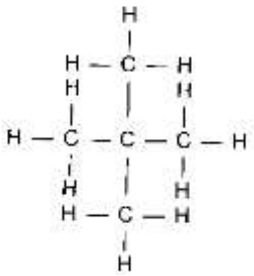
Haloalkane / Alkielhalied Haloalkanes √

2.3.4 (4)



n-pentaan

2,2-dimetielpropaan / 2,2 dimethylpropane √√



Dimetielpropaan / Dimethylpropane √√

[15]

VRAAG / QUESTION 3: (23)

3.1

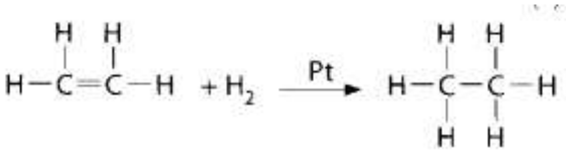
3.1.1 **A** – substitusie /halogenering // substitution / halogenation √

B – addisie /hidrogenering // addition / hydrogenation √

D – eliminasie/ dehidrasie // elimination / dehydration √

H – substitusie / hidrohalogenering // substitution / hydrohalogenation √

3.1.2 (4)



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

(3)

3.1.3

HBr of waterstofbromied // HBr or hydrogenbromide √

3.1.4.1 (1)

F eliminasie/ dehidrohalogenering // elimination / dehydrohalogenation √√

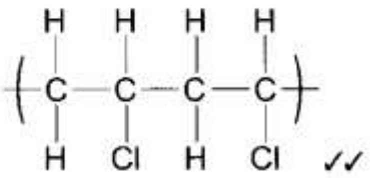
3.1.4.2 (2)

G Substitusie / substitution √√

3.1.4.3 (2)

Albei is 'n sterk basis √maar in F is die basis gekonsentreerd √√en G is dit verdun √//
Both are a strong base√ but the base is concentrated in F √√ and diluted in G √√

3.2.1 (4)



3.2.2 (2)

Addisie polimerisasie / addition polimerisation √

3.2.3 (1)

Polimeer bestaan uit 'n groot aantal struktuur eenhede of monomere √√
'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 geinduseerde 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 α 1 / DD √√
B. √ lowest BP and BP α 1 / DP √√

(3)

4.2.4 Compound **C :** √
Dipole-dipool kragte / Dipole – dipole forces

Compound **E :** √
Geinduseerde dipool kragte / London / Dispersie √
induced dipole forces (London / dispersion forces)

(2)

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)
[14]

VRAAG / QUESTION 5: (17)

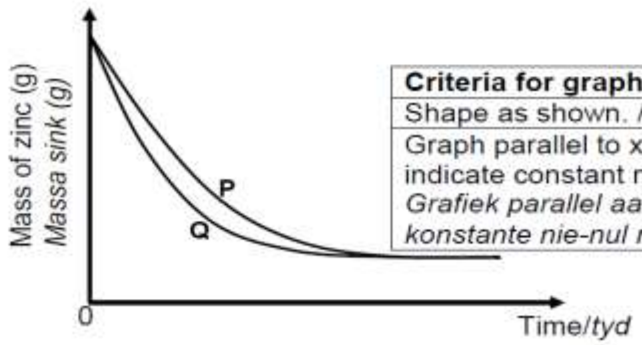
5

5.1 HCℓ of soutsuur // hydrochloric acid √√

(2)

5.2 Waterstofgas (H_2(g)) √ ontsnap√ uit die fles // Hydrogen gas √evaporates from the flask √ (2)

5.3 Asse / Axis √



Criteria for graph P: / *Riglyne vir grafiek P:*	
Shape as shown. / *Vorm soos aangetoon.*	√
Graph parallel to x-axis after a certain time to indicate constant non-zero mass of zinc. *Grafiek parallel aan x-as na 'n sekere tyd om konstante nie-nul massa van sink aan te dui.*	√

(3)

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 georiëenteerde 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 . √

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 = 0,02mol HCℓ
n = m/M √
0,01 = m/65 √
m = 0,65 g Zn

Oorspronklike massa //Original mass Zn is 0,65 + 0,12= 0,77 g √ (6)

[17]

VRAAG / QUESTION 6: (21)

6

6.1 In 'n geslote/geisoleerde 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 SO_3 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 $K_c = [SO_3]^2/[SO_2]^2[O_2]$ √ √
$=(0,2/2)^2$√√$/(0,2/2)^2(0,4/2)$ √ (punt vir bepaling van c / mark for calculation of c)
= 5 √ (5)

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

(2)
[21]

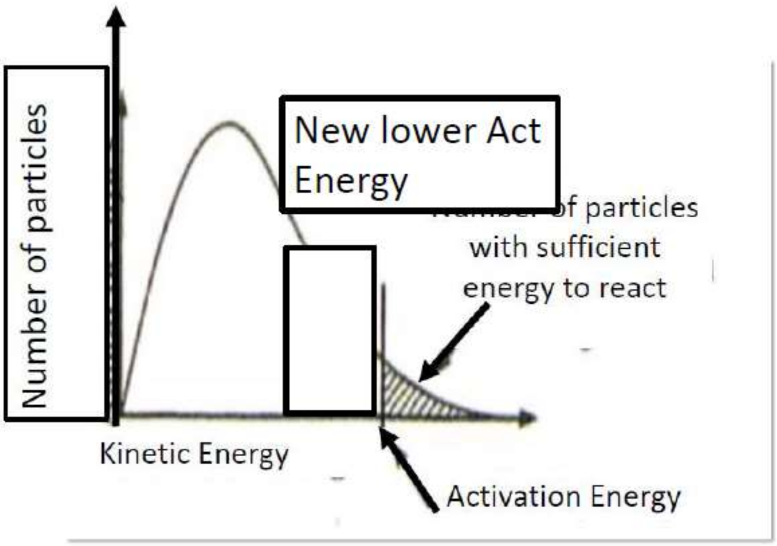
VRAAG / QUESTION 7 (13)

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 α E_k (gem) √√. Dus hoe laer die Ek van die deeltjies hoe minder effektiewe botsings √ is daar wat minder bindings tot gevolg het wat tempo van bederf laat afneem√.

Temperature α 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 $K_c = [Cr_2O_7^{-2}] / [CrO_4]^2[H^+]^2$ √ √ (2)

8.2.3 Minder produkte √, terugwaartse reaksie bevoordeel, √ Kc minder√ / Less product√; reverse reaction benefit√; Kc 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

K_c = $[AB_2]^2$ √ $[B_2]$ √ / $[AB_3]^2$ √
= $(3)^2$√(1.5) √ / $(2)^2$ √
= 3.38 √√

(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**