Western Cape Government

METRO NORTH EDUCATION DISTRICT

SCHOOL-BASED ASSESSMENT

SEPTEMBER TRIAL COMMON EXAMINATION

PHYSICAL SCIENCES P2 (CHEMISTRY)

TASK NO: 5

SEPTEMBER 2026

MARKS: 150

DURATION: 3 hours

This question paper consists of 15 pages and 4 data sheets

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INSTRUCTIONS AND INFORMATION:

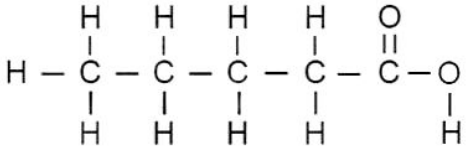
1. Write your name, surname and class on your ANSWER BOOK.
2. This question paper consists of TEN questions. Answer ALL questions in your ANSWER BOOK.
3. Start EACH question on a NEW page in your ANSWER BOOK.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Leave ONE line between two sub-questions, for example between QUESTION 2.1 and QUESTION 2.2.
6. You may use a non-programmable calculator.
7. You may use appropriate mathematical instruments.
8. Show ALL formulae and substitutions in ALL calculations.
9. Round off your FINAL numerical answers to a minimum of TWO decimal places.
10. Give brief motivations, discussions, et cetera where required.
11. You are advised to use the attached DATA SHEETS.
12. Write neatly and legibly.

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QUESTION 1

Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A - D) next to the question numbers (1.1 - 1.10) in the ANSWER BOOK, for example 1.11 E.

1.1 The structural formula of an organic compound is shown below:



Which one of the following is the correct IUPAC name for the functional isomer of this compound?

A Pentanoic acid.
B Methyl pentanoate.
C Methyl butanoate.
D Pentanone. (2)

1.2 A learner measures the boiling points of four primary bromoalkanes: bromoethane, 1-bromopropane,1-bromobutane and 1-bromopentane.

What is the independent variable in this investigation?

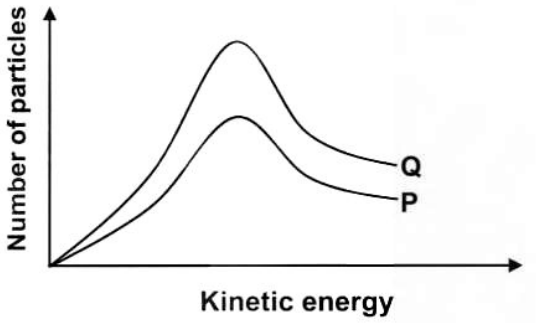
A Boiling point.
B Type of intermolecular force.
C Molecular mass/chain length.
D Type of functional group. (2)

1.3 Consider the reaction of $CH_3(CH_2)_4CH_3$ in the presence of strong heat, high pressures and platinum (Pt) as catalyst.

This reaction is best classified as a/an _____ reaction:

A Addition.
B Cracking.
C Substitution.
D Combustion. (2)

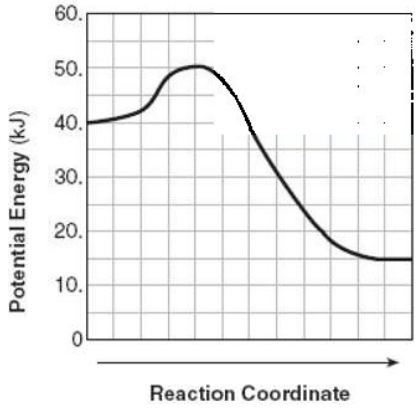
1.4 The graph below shows the Maxwell-Boltzmann distribution curve for carbon dioxide (CO_2) gas in a closed container. Curve **P** represents the distribution under the original conditions, while Curve **Q** was obtained after one reaction condition was changed.



Which ONE of the following changes resulted in Curve **Q**?

A Increasing the temperature of the CO_2 gas.
B Adding a catalyst.
C Increasing the concentration of the CO_2 gas.
D Increasing the surface area of the CO_2 gas. (2)

1.5 The potential energy versus reaction coordinate profile for a reaction at equilibrium is shown below:



Which ONE of the following disturbances will cause in INCREASE in the equilibrium constant?

A A temperature increase.
B A temperature decrease.
C A pressure increase.
D A pressure decrease. (2)

1.6 The hypothetical reaction shown below reaches equilibrium in a sealed container:

$$2\,A\,(g) + B\,(s) \rightleftharpoons 3\,C(g)$$

The chemist decreases the volume of the reaction vessel and makes the following predictions regarding the re-establishment of the new equilibrium following this disturbance:

(i) The forward reaction will be favoured.
(ii) The equilibrium constant will remain the same.
(iii) The number of moles of C present in the vessel will decrease.

Which of the chemist's statements are TRUE?

A i only.
B i and iii.
C ii and iii.
D ii only. (2)

1.7 Which ONE of the following salts will form an aqueous solution with a pH equal to 7 at 25 °C?

A Na_2CO_3.
B CH_3COONa.
C $NH_4C\ell$.
D $NaC\ell$. (2)

1.8 Two acid solutions, **X** and **Y**, of equal concentration are compared. The pH of solution **X** is 1, while the pH of solution **Y** is 4.

Which ONE of the following statements is CORRECT?

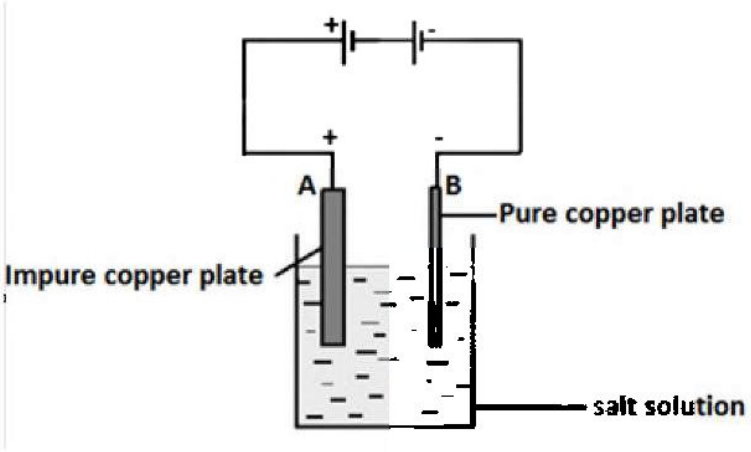
A Solution **X** is a weaker acid than solution **Y**.
B Solution **X** has a higher hydronium ion concentration than solution **Y**.
C Solution **Y** ionises more completely than solution **X**.
D Solution **X** will react more slowly with magnesium ribbon than solution **Y**. (2)

1.9 The E^{θ}-value of the $Cu^{2+}/Cu(s)$ electrode is usually determined using a standard H^+/H_2, Pt-electrode as reference electrode.

The equation for the half-reaction which occurs at the cathode of this cell is:

A $Cu^{2+} + 2\ e^- \rightarrow Cu\ (s)$
B $H_2\ (g) \rightarrow 2\ H^+ + 2\ e^-$
C $2\ H^+ + 2\ e^- \rightarrow H_2\ (g)$
D $Cu\ (s) \rightarrow Cu^{2+} + 2\ e^-$ (2)

1.10 To purify an impure copper plate the following setup is used.



The following statements are made regarding this cell:

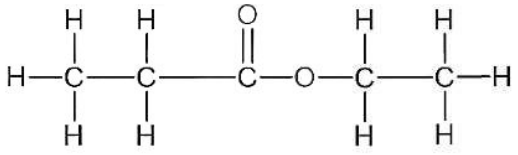
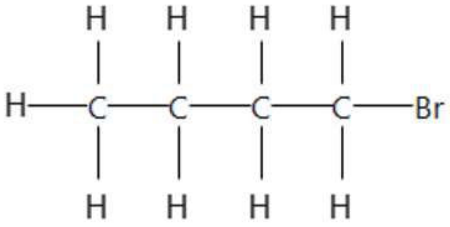
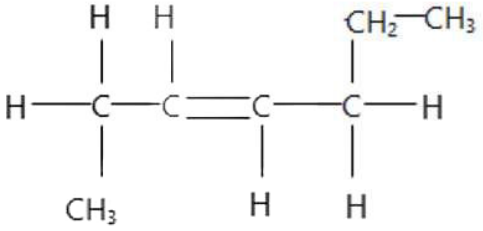
i) Electrode **A** is the cathode
ii) Electrode **B** is where reduction is taking place
iii) Copper sulphate would be a suitable salt solution to use

Which of these statements are TRUE?

A (i) only
B (ii) only
C (i) and (iii)
D (ii) and (iii) (2)
[20]

QUESTION 2 (Start on a new page)

The letters **A** to **F** in the table represent six organic compounds.

A	3,3-difloro-2-methylpentane	**B**	
C		**D**	
E	$CH_3CH_2COCH_2CH_3$	**F**	2-methylpropan-1-ol

2.1 Define the term *homologous series*. (2)

2.2 Write down the GENERAL FORMULA of the homologous series to which compound **C** belongs. (1)

2.3 Write down the IUPAC name of the following compounds:
2.3.1 **B** (2)
2.3.2 **D** (2)

2.4 Write down the STRUCTURAL FORMULA of the following compounds:
2.4.1 **A** (3)
2.4.2 **E** (2)

2.5 For compound **E**, write down the:
2.5.1 NAME of the FUNCTIONAL GROUP. (1)
2.5.2 STRUCTURAL FORMULA of its FUNCTIONAL isomer. (2)

2.6 Compound **F** is an alcohol.
2.6.1 Is compound **F** a PRIMARY, SECONDARY or TERTIARY alcohol? (1)
2.6.2 Give a reason for the answer to Question 2.6.1. (2)

2.7 A 5 g sample of a white powder contains 2,58 g carbon, 0,67 g hydrogen and 1,75 g oxygen.
Determine the empirical formula of this compound by means of a calculation. (4)
[22]

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QUESTION 3 (Start on a new page)

Learners use compounds **A**, **B** and **C** to investigate one of the factors that influences the VAPOUR PRESSURE of organic compounds.

A	Butan-1-ol
B	Butan-2-one
C	Propanoic acid

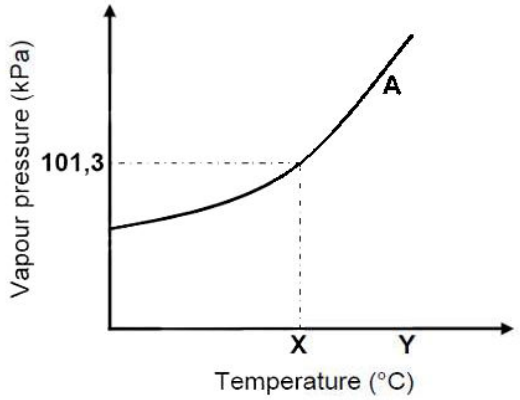
3.1 Define the term vapour pressure. (2)

3.2 Write down the independent variable for this investigation. (1)

3.3 Which compound, **A** or **B**, has the higher vapour pressure? (1)

3.4 Fully explain the answer to QUESTION 3.3.
Include the TYPES OF INTERMOLECULAR FORCES in your explanation. (4)

3.5 The graph below represents the relationship between vapour pressure and temperature for compound **A** at sea level. **X** and **Y** represent different temperatures.



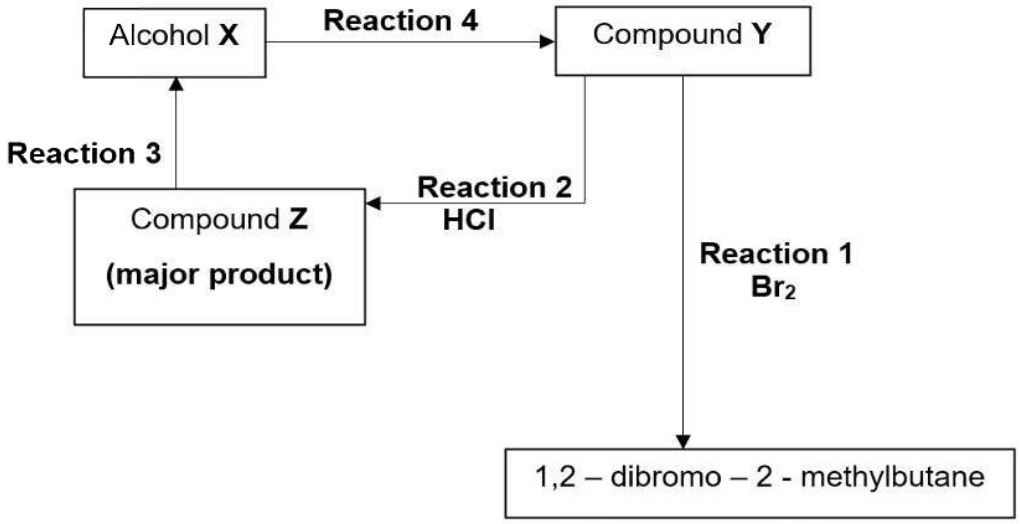
3.5.1 Write down the term for the temperature represented by **X**. (1)

3.5.2 State the phase of compound **A** at temperature **Y**. Choose from GAS, LIQUID or SOLID. (1)

3.5.3 Redraw the graph above in your ANSWER BOOK. On the same set of axes, sketch the curve that will be obtained for compound **C**. Clearly label curve **A** and curve **C**. (2)
[12]

QUESTION 4 (Start on a new page)

4.1 The flow diagram below shows different organic reactions. X, Y and Z are organic compounds.



Reaction 1 is an addition reaction. Write down:

4.1.1 The TYPE of addition reaction. (1)

4.1.2 One observable change which occurs in the container during the reaction. (1)

4.1.3 The STRUCTURAL FORMULA of compound Y. (3)

Consider **reaction 2**.

4.1.4 Write down the IUPAC name of compound **Z**. (2)

For **reaction 3**, write down:

4.1.5 A balanced equation using CONDENSED structural formulae. (4)

4.1.6 The IUPAC name of alcohol **X.** (2)

Reaction 4 is an elimination reaction

4.1.7 Write down the TYPE of elimination reaction. (1)

4.2 Propan–1–ol reacts with butanoic acid in the presence of a catalyst.
Write down the:

4.2.1 TYPE of reaction that takes place. (1)

4.2.2 IUPAC name of the organic product formed. (2)

[17]

QUESTION 5 (Start on a new page)

The reaction between zinc, Zn(s) and an EXCESS of diluted hydrochloric acid, HCℓ(aq) is used to investigate one of the factors that affects reaction rate. The balanced equation for the reaction is below:

$$Zn(s) + 2\,HC\ell(aq) \rightarrow ZnC\ell_2(aq) + H_2(g)$$

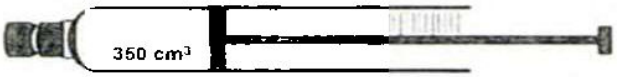
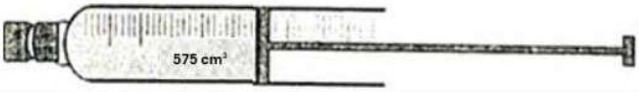
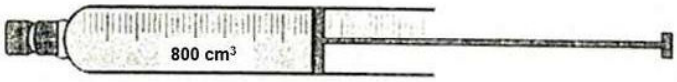
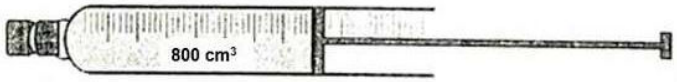
In all experiments, the mass of zinc granules and the volume of hydrochloric acid were kept constant.

The reaction conditions for each experiment are summarised in the table below.

EXPERIMENT	VOLUME OF HCℓ (aq) in cm^3	CONCENTRATION OF HCℓ(aq) in $mol.dm^{-3}$	TEMPERATURE OF HCℓ(aq) in °C
A	750	0,20	25
B	750	0,20	30
C	750	0,20	35
D	750	0,10	40

5.1 Identify the independent variable for experiment **A** to **C** for this investigation. (1)

The hydrogen gas, $H_2(g)$, produced during EXPERIMENT A is collected in a gas syringe. The volume of the gas collected is shown in the table below.

READING	TIME (s)	VOLUME OF $H_2(g)$ in cm^3
1	30	
2	45	
3	60	
4	75	

5.2 After how many seconds was the reaction completed? Motivate your answer. (2)

5.3 Which reactant is the limiting reagent? (1)

5.4 Calculate the rate (in $cm^3.s^{-1}$) at which $H_2(g)$ is produced during this experiment. (3)

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5.5 How will the volume of the $H_2(g)$ gas produced during EXPERIMENT B compare to that produced during EXPERIMENT A?

Choose from GREATER THAN, SMALLER THAN or EQUAL TO. (1)

5.6 Why is EXPERIMENT **D** considered not valid for comparison with the other experiments in this investigation? (1)

5.7 How will the rate at which $H_2(g)$ is produced during EXPERIMENT **B,** compare to the rate during EXPERIMENT **A**?

Choose from INCREASE, DECREASE or REMAINS THE SAME.
Use the collision theory to fully explain your answer. (4)

5.8 Given that the molar gas volume at 25 °C is 24,7 $dm^3 \cdot mol^{-1}$, calculate the new concentration of HCℓ(aq) upon completion of EXPERIMENT A.

Assume that the volume of the HCℓ(aq) remains constant. (5)
[18]

QUESTION 6 (Start on a new page)

The following reversible reaction takes place when cobalt chloride is dissolved in water:

$$[CoC\ell_4]^{2-}(aq) + 6\ H_2O(\ell) \rightleftarrows [Co(H_2O)_6]^{2+}(aq) + 4\ C\ell^-(aq)$$

dark blue — light pink

The cobalt chloride ion, $[CoC\ell_4]^{2-}$, has a dark blue colour whereas the cobalt hexahydrate ion, $[Co(H_2O)_6]^{2+}$, has a light pink colour.

The system reaches equilibrium and the solution has a light pink colour.

6.1 Define chemical equilibrium. (2)

6.2 What will the K_c value be for this reaction? Write GREATER THAN ONE or LESS THAN ONE. Give a reason for your answer. (2)

6.3 State Le Chatelier's principle. (2)

6.4 Predict which reaction will be favoured by the changes stated below.
Write only FORWARD or REVERSE or NEITHER.

6.4.1 $[CoC\ell_4]^{2-}$ is removed. (1)

6.4.2 Silver nitrate is added. (1)

6.5 Use Le Chatelier's principle to explain your answer to question 6.4.2. (3)

6.6 A scientist mixes 0,6 mol nitrogen gas with x mols hydrogen gas in a closed 2 dm^3 container at T °C. The nitrogen and hydrogen react to form ammonia (NH_3) according to the balanced chemical equation:

$$N_2\ (g) + 3\ H_2\ (g) \rightleftarrows 2\ NH_3\ (g)$$

At equilibrium, there are 4,42 g NH_3. Determine the **INITIAL mass** of hydrogen in the container if the equilibrium constant is 3,864 at T °C.

(9)
[20]

QUESTION 7 (Start on a new page)

7.1 Sulphuric acid is a diprotic acid.

7.1.1 Explain what is meant by a *diprotic acid*. (1)

7.1.2 Write a balanced equation for the full ionization of sulphuric acid. (3)

7.1.3 Is sulphuric acid a strong or a weak acid? Explain your answer in terms of sulphuric acids K_a value. (2)

7.2 A concentrated sulphuric acid solution has a concentration of 0,05 $mol.dm^{-3}$.

7.2.1 Define the term *concentrated acid.* (2)

7.2.2 Calculate the pH of this solution. Assume that the acid ionises completely. (4)

7.2.3 1,5 ℓ of the above solution is allowed to react with **X** g of unpure $CaCO_3$ according to the following balanced equation:

$$H_2SO_4 + CaCO_3 \rightarrow CaSO_4 + H_2O + CO_2$$

The $CaCO_3$ is the limiting reagent in the above reaction, and the excess sulphuric acid neutralizes 60 ml of a 0,2 $mol.dm^{-3}$ NaOH-solution, according to the following balanced equation:

$$H_2SO_4 + 2\,NaOH \rightarrow Na_2SO_4 + 2\,H_2O$$

The $CaCO_3$ is 70% pure. Calculate **X**. (7)

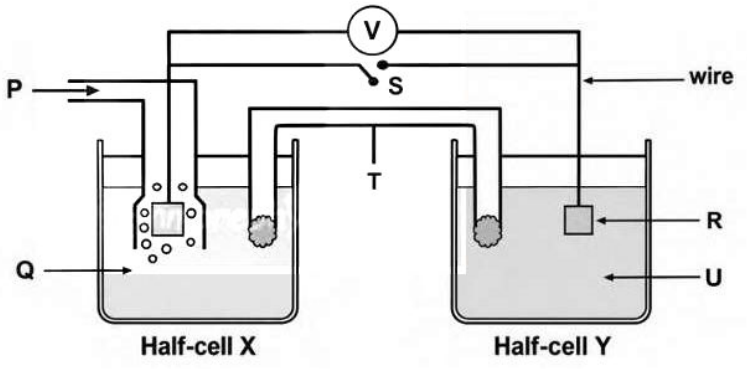
[19]

QUESTION 8 (Start on a new page)

8.1 Chlorine gas and iron (II) ions react in aqueous solution as follows:

$$C\ell_2 + 2\ Fe^{2+} \rightarrow 2\ C\ell^- + 2\ Fe^{3+}$$

A Grade 12 class used the cell shown below to determine the cell potential (E^{θ}_{cell}) for the above reaction under standard conditions.



Give the CHEMICAL FORMULAE of the substances represented by the following letters:

8.1.1 P (1)

8.1.2 Q (1)

8.1.3 R (1)

8.2 Consider the component labelled T.

8.2.1 Which of the following salts is suitable to be used in part T? Write only sodium nitrate ($NaNO_3$) OR silver chloride ($AgC\ell$). (1)

8.2.2 Give ONE reason for your choice of the salt in Question 8.2.1. (1)

8.3 Calculate the initial cell potential (E^{θ}_{cell}) for this cell under standard conditions. (4)

8.4 Identify the reducing agent in this cell. (1)

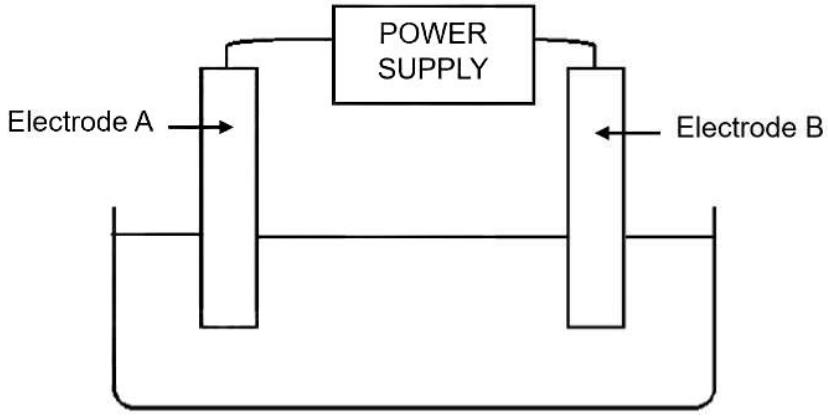
8.5 Write down the correct options between the brackets in the statement below.

When switch S is closed, electrons will flow from half-cell 8.5.1 (**X** to **Y** OR **Y** to **X**) through 8.5.2 (THE EXTERNAL CIRCUIT or T). (2)

[12]

QUESTION 9 (Start on a new page)

The simplified diagram below represents an electrochemical cell used for the electrolysis of a concentrated copper (II) chloride solution, $CuC\ell_2(aq)$.



9.1 Define the term *electrolytic cell*. (2)

9.2 A gas starts to form at electrode **B**. Write down the:

9.2.1 NAME or FORMULA of the gas that is forming. (1)

9.2.2 Electrode at which reduction is taking place. State only **A** or **B**. (1)

9.2.3 Will the mass of electrode **A** INCREASE, DECREASE or STAY THE SAME. (1)

9.2.4 The electrode to which the negative terminal of the power supply is connected. State only **A** or **B**. (1)

9.2.5 Balanced equation for the net (overall) cell reaction that takes place in the cell. (3)

9.2.6 FORMULA of a suitable substance to use for electrode **B**. (1)
[10]

GRAND TOTAL: 150

DATA FOR PHYSICAL SCIENCES PAPER 2 (CHEMISTRY)

GEGEWENS VIR FISIESE WETENSKAPPE VRAESTEL 2 (CHEMIE)

TABLE 1: PHYSICAL CONSTANTS/*TABEL 1: FISIESE KONSTANTES*

NAME/*NAAM*	SYMBOL/*SIMBOOL*	VALUE/*WAARDE*
Standard pressure *Standaarddruk*	p^θ	$1{,}013 \times 10^5$ Pa
Molar gas volume at STP *Molêre gasvolume by STD*	V_m	22,4 $dm^3 \cdot mol^{-1}$
Standard temperature *Standaardtemperatuur*	T^θ	273 K
Charge on electron *Lading op elektron*	e	$-1{,}6 \times 10^{-19}$ C
Avogadro's constant *Avogadro-konstante*	N_A	$6{,}02 \times 10^{23}$ mol^{-1}

TABLE 2: FORMULAE/*TABEL 2: FORMULES*

$n = \frac{m}{M}$	$n = \frac{N}{N_A}$
$c = \frac{n}{V}$ or/*of* $c = \frac{m}{MV}$	$n = \frac{V}{V_m}$
$\frac{c_a v_a}{c_b v_b} = \frac{n_a}{n_b}$	pH = -log[H_3O^+]
$K_w = [H_3O^+][OH^-] = 1 \times 10^{-14}$ at/*by* 298 K	
$E^\theta_{cell} = E^\theta_{cathode} - E^\theta_{anode}$ / $E^\theta_{sel} = E^\theta_{katode} - E^\theta_{anode}$ or/*of* $E^\theta_{cell} = E^\theta_{reduction} - E^\theta_{oxidation}$ / $E^\theta_{sel} = E^\theta_{reduksie} - E^\theta_{oksidasie}$ or/*of* $E^\theta_{cell} = E^\theta_{oxidising\ agent} - E^\theta_{reducing\ agent}$ / $E^\theta_{sel} = E^\theta_{oksideermi\ ddel} - E^\theta_{reduseermi\ ddel}$	

TABLE 3: THE PERIODIC TABLE OF ELEMENTS
TABEL 3: DIE PERIODIEKE TABEL VAN ELEMENTE

1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)
2,1 H 1																	2 He 4
1,0 Li 7	1,5 Be 9											2,0 B 11	2,5 C 12	3,0 N 14	3,5 O 16	4,0 F 19	10 Ne 20
0,9 Na 23	1,2 Mg 24											1,5 Aℓ 27	1,8 Si 28	2,1 P 31	2,5 S 32	3,0 Cℓ 35,5	18 Ar 40
0,8 K 39	1,0 Ca 40	1,3 Sc 45	1,5 Ti 48	1,6 V 51	1,6 Cr 52	1,5 Mn 55	1,8 Fe 56	1,8 Co 59	1,8 Ni 59	1,9 Cu 63,5	1,6 Zn 65	1,6 Ga 70	1,8 Ge 73	2,0 As 75	2,4 Se 79	2,8 Br 80	36 Kr 84
0,8 Rb 86	1,0 Sr 88	1,2 Y 89	1,4 Zr 91	Nb 92	1,8 Mo 96	1,9 Tc	2,2 Ru 101	2,2 Rh 103	2,2 Pd 106	1,9 Ag 108	1,7 Cd 112	1,7 In 115	1,8 Sn 119	1,9 Sb 122	2,1 Te 128	2,5 I 127	54 Xe 131
0,7 Cs 133	0,9 Ba 137	La 139	1,6 Hf 179	Ta 181	W 184	Re 186	Os 190	Ir 192	Pt 195	Au 197	Hg 201	1,8 Tℓ 204	1,8 Pb 207	1,9 Bi 209	2,0 Po	2,5 At	86 Rn
0,7 Fr	0,9 Ra 226	Ac															

58 Ce 140	59 Pr 141	60 Nd 144	61 Pm	62 Sm 150	63 Eu 152	64 Gd 157	65 Tb 159	66 Dy 163	67 Ho 165	68 Er 167	69 Tm 169	70 Yb 173	71 Lu 175
90 Th 232	91 Pa	92 U 238	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

KEY/*SLEUTEL*

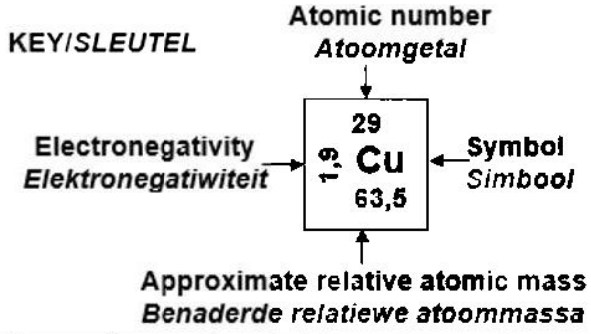


TABLE 4A: STANDARD REDUCTION POTENTIALS
TABEL 4A: STANDAARDREDUKSIEPOTENSIALE

Increasing oxidising ability/*Toenemende oksiderende vermoë* ↑

Increasing reducing ability/*Toenemende reduserende vermoë* ↓

Half-reactions/*Halfreaksies*	E^{θ} (V)
$F_2(g) + 2e^- \rightleftharpoons 2F^-$	+ 2,87
$Co^{3+} + e^- \rightleftharpoons Co^{2+}$	+ 1,81
$H_2O_2 + 2H^+ + 2e^- \rightleftharpoons 2H_2O$	+1,77
$MnO_4^- + 8H^+ + 5e^- \rightleftharpoons Mn^{2+} + 4H_2O$	+ 1,51
$Cl_2(g) + 2e^- \rightleftharpoons 2Cl^-$	+ 1,36
$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightleftharpoons 2Cr^{3+} + 7H_2O$	+ 1,33
$O_2(g) + 4H^+ + 4e^- \rightleftharpoons 2H_2O$	+ 1,23
$MnO_2 + 4H^+ + 2e^- \rightleftharpoons Mn^{2+} + 2H_2O$	+ 1,23
$Pt^{2+} + 2e^- \rightleftharpoons Pt$	+ 1,20
$Br_2(\ell) + 2e^- \rightleftharpoons 2Br^-$	+ 1,07
$NO_3^- + 4H^+ + 3e^- \rightleftharpoons NO(g) + 2H_2O$	+ 0,96
$Hg^{2+} + 2e^- \rightleftharpoons Hg(\ell)$	+ 0,85
$Ag^+ + e^- \rightleftharpoons Ag$	+ 0,80
$NO_3^- + 2H^+ + e^- \rightleftharpoons NO_2(g) + H_2O$	+ 0,80
$Fe^{3+} + e^- \rightleftharpoons Fe^{2+}$	+ 0,77
$O_2(g) + 2H^+ + 2e^- \rightleftharpoons H_2O_2$	+ 0,68
$I_2 + 2e^- \rightleftharpoons 2I^-$	+ 0,54
$Cu^+ + e^- \rightleftharpoons Cu$	+ 0,52
$SO_2 + 4H^+ + 4e^- \rightleftharpoons S + 2H_2O$	+ 0,45
$2H_2O + O_2 + 4e^- \rightleftharpoons 4OH^-$	+ 0,40
$Cu^{2+} + 2e^- \rightleftharpoons Cu$	+ 0,34
$SO_4^{2-} + 4H^+ + 2e^- \rightleftharpoons SO_2(g) + 2H_2O$	+ 0,17
$Cu^{2+} + e^- \rightleftharpoons Cu^+$	+ 0,16
$Sn^{4+} + 2e^- \rightleftharpoons Sn^{2+}$	+ 0,15
$S + 2H^+ + 2e^- \rightleftharpoons H_2S(g)$	+ 0,14
$2H^+ + 2e^- \rightleftharpoons H_2(g)$	0,00
$Fe^{3+} + 3e^- \rightleftharpoons Fe$	− 0,06
$Pb^{2+} + 2e^- \rightleftharpoons Pb$	− 0,13
$Sn^{2+} + 2e^- \rightleftharpoons Sn$	− 0,14
$Ni^{2+} + 2e^- \rightleftharpoons Ni$	− 0,27
$Co^{2+} + 2e^- \rightleftharpoons Co$	− 0,28
$Cd^{2+} + 2e^- \rightleftharpoons Cd$	− 0,40
$Cr^{3+} + e^- \rightleftharpoons Cr^{2+}$	− 0,41
$Fe^{2+} + 2e^- \rightleftharpoons Fe$	− 0,44
$Cr^{3+} + 3e^- \rightleftharpoons Cr$	− 0,74
$Zn^{2+} + 2e^- \rightleftharpoons Zn$	− 0,76
$2H_2O + 2e^- \rightleftharpoons H_2(g) + 2OH^-$	− 0,83
$Cr^{2+} + 2e^- \rightleftharpoons Cr$	− 0,91
$Mn^{2+} + 2e^- \rightleftharpoons Mn$	− 1,18
$A\ell^{3+} + 3e^- \rightleftharpoons A\ell$	− 1,66
$Mg^{2+} + 2e^- \rightleftharpoons Mg$	− 2,36
$Na^+ + e^- \rightleftharpoons Na$	− 2,71
$Ca^{2+} + 2e^- \rightleftharpoons Ca$	− 2,87
$Sr^{2+} + 2e^- \rightleftharpoons Sr$	− 2,89
$Ba^{2+} + 2e^- \rightleftharpoons Ba$	− 2,90
$Cs^+ + e^- \rightleftharpoons Cs$	- 2,92
$K^+ + e^- \rightleftharpoons K$	− 2,93
$Li^+ + e^- \rightleftharpoons Li$	− 3,05

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TABLE 4B: STANDARD REDUCTION POTENTIALS
TABEL 4B: STANDAARDREDUKSIEPOTENSIALE

Increasing oxidising ability/*Toenemende oksiderende vermoë* ↓

Half-reactions/*Halfreaksies*	E^{θ} (V)
$Li^+ + e^- \rightleftharpoons Li$	−3,05
$K^+ + e^- \rightleftharpoons K$	−2,93
$Cs^+ + e^- \rightleftharpoons Cs$	−2,92
$Ba^{2+} + 2e^- \rightleftharpoons Ba$	−2,90
$Sr^{2+} + 2e^- \rightleftharpoons Sr$	−2,89
$Ca^{2+} + 2e^- \rightleftharpoons Ca$	−2,87
$Na^+ + e^- \rightleftharpoons Na$	−2,71
$Mg^{2+} + 2e^- \rightleftharpoons Mg$	−2,36
$A\ell^{3+} + 3e^- \rightleftharpoons A\ell$	−1,66
$Mn^{2+} + 2e^- \rightleftharpoons Mn$	−1,18
$Cr^{2+} + 2e^- \rightleftharpoons Cr$	−0,91
$2H_2O + 2e^- \rightleftharpoons H_2(g) + 2OH^-$	−0,83
$Zn^{2+} + 2e^- \rightleftharpoons Zn$	−0,76
$Cr^{3+} + 3e^- \rightleftharpoons Cr$	−0,74
$Fe^{2+} + 2e^- \rightleftharpoons Fe$	−0,44
$Cr^{3+} + e^- \rightleftharpoons Cr^{2+}$	−0,41
$Cd^{2+} + 2e^- \rightleftharpoons Cd$	−0,40
$Co^{2+} + 2e^- \rightleftharpoons Co$	−0,28
$Ni^{2+} + 2e^- \rightleftharpoons Ni$	−0,27
$Sn^{2+} + 2e^- \rightleftharpoons Sn$	−0,14
$Pb^{2+} + 2e^- \rightleftharpoons Pb$	−0,13
$Fe^{3+} + 3e^- \rightleftharpoons Fe$	−0,06
$\mathbf{2H^+ + 2e^- \rightleftharpoons H_2(g)}$	0,00
$S + 2H^+ + 2e^- \rightleftharpoons H_2S(g)$	**+ 0,14**
$Sn^{4+} + 2e^- \rightleftharpoons Sn^{2+}$	**+ 0,15**
$Cu^{2+} + e^- \rightleftharpoons Cu^+$	+ 0,16
$SO_4^{2-} + 4H^+ + 2e^- \rightleftharpoons SO_2(g) + 2H_2O$	**+ 0,17**
$Cu^{2+} + 2e^- \rightleftharpoons Cu$	**+ 0,34**
$2H_2O + O_2 + 4e^- \rightleftharpoons 4OH^-$	**+ 0,40**
$SO_2 + 4H^+ + 4e^- \rightleftharpoons S + 2H_2O$	+ 0,45
$Cu^+ + e^- \rightleftharpoons Cu$	**+ 0,52**
$I_2 + 2e^- \rightleftharpoons 2I^-$	+ 0,54
$O_2(g) + 2H^+ + 2e^- \rightleftharpoons H_2O_2$	+ 0,68
$Fe^{3+} + e^- \rightleftharpoons Fe^{2+}$	+ 0,77
$NO_3^- + 2H^+ + e^- \rightleftharpoons NO_2(g) + H_2O$	+ 0,80
$Ag^+ + e^- \rightleftharpoons Ag$	+ 0,80
$Hg^{2+} + 2e^- \rightleftharpoons Hg(\ell)$	+ 0,85
$NO_3^- + 4H^+ + 3e^- \rightleftharpoons NO(g) + 2H_2O$	+ 0,96
$Br_2(\ell) + 2e^- \rightleftharpoons 2Br^-$	+ 1,07
$Pt^{2+} + 2e^- \rightleftharpoons Pt$	+ 1,20
$MnO_2 + 4H^+ + 2e^- \rightleftharpoons Mn^{2+} + 2H_2O$	+ 1,23
$O_2(g) + 4H^+ + 4e^- \rightleftharpoons 2H_2O$	+ 1,23
$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightleftharpoons 2Cr^{3+} + 7H_2O$	+ 1,33
$C\ell_2(g) + 2e^- \rightleftharpoons 2C\ell^-$	+ 1,36
$MnO_4^- + 8H^+ + 5e^- \rightleftharpoons Mn^{2+} + 4H_2O$	+ 1,51
$H_2O_2 + 2H^+ + 2e^- \rightleftharpoons 2H_2O$	+1,77
$Co^{3+} + e^- \rightleftharpoons Co^{2+}$	+ 1,81
$F_2(g) + 2e^- \rightleftharpoons 2F^-$	+ 2,87

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