



CMY 117
SEMESTERTOETS 2 / SEMESTER TEST 2

DATUM / DATE: 29 Maart 2010
TYD / TIME: 2½ ure / hours
PUNTE / MARKS: 100
Afdeling A / Section A: 40
Afdeling B / Section B: 60

EKSAMINATORE:
EXAMINERS:

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EKSTERN / EXTERNAL:

AFDELING B / SECTION B

INSTRUKSIES

1. Beantwoord die volgende vrae op die rekenaar- antwoordblad.
2. Gebruik slegs kant 2 van die antwoordblad.
3. Slegs een antwoord per vraag is toelaatbaar.
4. Geen punte word oorweeg vir onduidelike antwoorde nie. Dit is u verantwoordelikheid op te sorg dat die antwoordblad leesbaar is vir die optiese merkleser. Alle instruksies is op die antwoordvorm aangebring.
5. Die puntetoekenning per vraag mag varieer en word by elke vraag aangedui.
6. Antwoorde word nie negatief nagesien nie.
7. Vir berekeninge moet die numeriese inligting van die aangehegte Periodieke tabel gebruik word.

INSTRUCTIONS

1. Answer the following questions on the computer answer sheet.
2. Use only side 2 of the answer sheet.
3. Only one answer per question is allowed.
4. No marks are considered for unclear answers. It is your responsibility to ensure that the answer sheet is readable by the optical mark reader. All instructions are provided on the answer sheet.
5. The allocation of marks per question may vary, but is indicated at each question.
6. Answers are not marked negatively.
7. The numerical information from the attached Periodic Table must be used for calculations.

Vraag 1

Merk opsie J van Vraag 1 op u rekenaarantwoordblad.
Dit is slegs vir kontroledoelindes.

Question 1

Mark option J of Question 1 on your computer answer sheet. This is for control purposes only.

Vraag 2

[2]

Die empiriese formule van 'n sekere verbinding is C_3H_5O .
Watter een van die volgende kan die molekulêre formule van hierdie verbinding wees?

- A $C_9H_{14}O_3$
 B $C_9H_{15}O_2$
 C $C_9H_{15}O_4$
 D $C_{12}H_{12}O_4$
 E $C_{12}H_{20}O_4$
 F $C_{12}H_{24}O_4$
 G $C_{15}H_{25}O_4$
 H $C_{15}H_{25}O$
 I $C_{15}H_{20}O_5$
 J Nie een van bogenoemde nie.

K_3PO_4
 $Mr = (117.3 + 30.97 + 64)$
 $= 212.27$

Question 2

[2]

The empirical formula of a certain compound is C_3H_5O .
Which one of the following can be the molecular formula of this compound?

- A $C_9H_{14}O_3$
 B $C_9H_{15}O_2$
 C $C_9H_{15}O_4$
 D $C_{12}H_{12}O_4$
 E $C_{12}H_{20}O_4$
 F $C_{12}H_{24}O_4$
 G $C_{15}H_{25}O_4$
 H $C_{15}H_{25}O$
 I $C_{15}H_{20}O_5$
 J None of the above.

Vraag 3

[2]

Bereken die persentasie kalium in kaliumfosfaat. Skryf die antwoord as 'n gewone desimale getal.

Die eerste desimaal van die getal is die volgende:

- A 0

Voorbeeld:
23.67%

Question 3

[2]

Calculate the percent potassium in potassium phosphate. Write the answer as a normal decimal number.

The first decimal of the number is the following:

- A 0

Example:
23.67%

- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Vraag 4

[2]

Watter een van die volgende verbindings is onoplosbaar in water?

- A ~~(NH₄)₂S~~
- B (NH₄)₂SO₄
- C (NH₄)₃PO₄
- ✓ D NaS
- ✓ E CuS
- F K₂CO₃
- G Li₂CO₃
- H Ba(OH)₂
- I AlI₃
- J Nie een van bogenoemde nie.

Vraag 5

[2]

'n Oplossing van natriumnitrat word (individueel) by die volgende oplossings gevoeg. In watter geval sal 'n neerslag vorm?

- A ~~(NH₄)₂SO₄~~ + NaNO₃
- B Li₂SO₄
- C Li₂S
- D NaI
- E KBr
- F K₂CO₃
- G K₂C₂O₄
- H NH₃
- I HBr
- J Nie een van bogenoemde nie.

Vraag 6

[2]

'n Oplossing van salpetersuur word (individueel) by die volgende oplossings gevoeg. In watter geval sal 'n kleurlose en reuklose gas vorm?

- A (NH₄)₂SO₄
- B Na₂SO₄
- C Na₂S
- D NaI
- E KBr
- F K₂CO₃
- G K₂C₂O₄
- H NH₃
- I HBr
- J Nie een van bogenoemde nie.

- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Question 4

[2]

Which one of the following compounds is insoluble in water?

- A (NH₄)₂S
- B (NH₄)₂SO₄
- C (NH₄)₃PO₄
- D NaS
- E CuS
- F K₂CO₃
- G Li₂CO₃
- H Ba(OH)₂
- I AlI₃
- J None of the above.

Question 5

[2]

A solution of sodium nitrate is added (individually) to the following solutions. In which case will a precipitate form?

- A (NH₄)₂SO₄
- B Li₂SO₄
- C Li₂S
- D NaI
- E KBr
- F K₂CO₃
- G K₂C₂O₄
- H NH₃
- I HBr
- J None of the above.

Question 6

[2]

A solution of nitric acid is added (individually) to the following solutions. In which case will a colourless and odourless gas be formed?

- A (NH₄)₂SO₄
- B Na₂SO₄
- C Na₂S
- D NaI
- E KBr
- F K₂CO₃
- G K₂C₂O₄
- H NH₃
- I HBr
- J None of the above.

Vraag 7

[2]

'n Oplossing van perchloorsuur word (individueel) by die volgende oplossings gevoeg. In watter geval sal 'n kleurlose maar onwelriekende gas vorm?

- A $(\text{NH}_4)_2\text{SO}_4$
 B Na_2SO_4
 C Na_2S
 D NaI
 E KBr
 F K_2CO_3
 G $\text{K}_2\text{C}_2\text{O}_4$
 H NH_3
 I HBr
 J Nie een van bogenoemde nie.

*HClO₄***Vraag 8**

[2]

Watter een van die volgende gevalle sluit 'n element in met oksidasiegetal gelyk aan +7?

- A $\text{K}_2\text{Cr}_2\text{O}_7$
 B $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
 C $(\text{NH}_4)_2\text{CrO}_4$
 D KMnO_4
 E MnO_2
 F K_2MnO_4
 G MnSO_4
 H PO_4^{3-}
 I HPO_4^{2-}
 J Nie een van bogenoemde nie.

*reduksie***Vraag 9**

[2]

Reduksie kan beskryf word as

- A wins van elektrone en 'n toename van die oksidasiegetal.
 B wins van elektrone en 'n afname van die oksidasiegetal.
 C verlies van elektrone en 'n toename van die oksidasiegetal.
 D verlies van elektrone en 'n afname van die oksidasiegetal.
 E wins van elektrone wanneer die oksidasiegetal konstant bly.
 F afname van elektrone wanneer die oksidasiegetal konstant bly.
 G toename van die oksidasiegetal terwyl geen elektrone oorgedra word nie.
 H afname van die oksidasiegetal terwyl geen elektrone oorgedra word nie.
 I Nie een van bogenoemde nie.

Question 7

[2]

A solution of perchloric acid is added (individually) to the following solutions. In which case will a colourless but foul smelling gas be formed?

- A $(\text{NH}_4)_2\text{SO}_4$
 B Na_2SO_4
 C Na_2S
 D NaI
 E KBr
 F K_2CO_3
 G $\text{K}_2\text{C}_2\text{O}_4$
 H NH_3
 I HBr
 J None of the above.

Question 8

[2]

Which one of the following cases includes an element with oxidation state equal to +7?

- A $\text{K}_2\text{Cr}_2\text{O}_7$
 B $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
 C $(\text{NH}_4)_2\text{CrO}_4$
 D KMnO_4
 E MnO_2
 F K_2MnO_4
 G MnSO_4
 H PO_4^{3-}
 I HPO_4^{2-}
 J None of the above.

Question 9

[2]

Reduction can be described as

- A gain of electrons and an increase of the oxidation number.
 B gain of electrons and a decrease of the oxidation number.
 C loss of electrons and an increase of the oxidation number.
 D loss of electrons and a decrease of the oxidation number.
 E gain of electrons when the oxidation number remains the same.
 F loss of electrons when the oxidation number remains the same.
 G increase of the oxidation number while no electrons are transferred.
 H decrease of the oxidation number while no electrons are transferred.
 I None of the above.

Vraag 10

Klein vaste stukkie van die volgende metale word (individueel) gevoeg by 'n oplossing van kalsiumkatione. In watter geval sal 'n redoksreaksie plaasvind? (Wenk: gebruik inligting van die datablad.)

- A Ag
 B Ni
 C Zn
 D Mn
 E Au
 F Al
 G Na
 H Ba
 I Fe
 J Nie een van bogenoemde nie.

Ca⁺

[2]

Question 10

Small solid pieces of the following metals are added (individually) to a solution of calcium cations. In which case will a redox reaction take place? (Hint: use information from the information page.)

- A Ag
 B Ni
 C Zn
 D Mn
 E Au
 F Al
 G Na
 H Ba
 I Fe
 J None of the above.

[2]

Vraag 11

Klein vaste stukkie van die volgende metale word (individueel) gevoeg by 'n soutsuuroplossing. In watter geval sal 'n redoksreaksie nie plaasvind nie? (Wenk: gebruik inligting van die datablad.)

- A Ag
 B Ni
 C Zn
 D Mn
 E Li
 F Al
 G Na
 H Ba
 I Fe
 J Nie een van bogenoemde nie.

HCl

[2]

Question 11

Small solid pieces of the following metals are added (individually) to a solution of hydrochloric acid. In which case will a redox reaction not take place? (Hint: use information from the information page.)

- A Ag
 B Ni
 C Zn
 D Mn
 E Li
 F Al
 G Na
 H Ba
 I Fe
 J None of the above.

[2]

Vrae 12 en 13 verwys na die volgende scenario:

Twee oplossings word bymekaar gevoeg:

- 150. cm³ van 'n 0.355 mol.dm⁻³ oplossing van natriumbromide;
- 250. cm³ van 'n 0.711 mol.dm⁻³ oplossing van magnesiumbromied;
- 100. cm³ gedistilleerde water word by hierdie mengsel gevoeg.

Die oplossing word goed gemeng.

Questions 12 and 13 refer to the following scenario:

Two solutions are added together:

- 150. cm³ of a 0.355 mol.dm⁻³ solution of lithium bromide;
- 250. cm³ of a 0.711 mol.dm⁻³ solution of magnesium bromide;
- 100. cm³ distilled water is added to this mixture.

The solution is well mixed.

Vraag 12

Bereken die konsentrasie van die bromiedanione in die finale oplossing. Skryf die antwoord as 'n gewone desimale getal.

Die eerste desimaal van die getal is

- A 0
 B 1
 C 2
 D 3
 E 4

[3]

Question 12

Calculate the concentration of the bromide anions in the final solution. Write the answer as a normal decimal number.

The first decimal of the number is the following:

- A 0
 B 1
 C 2
 D 3
 E 4

[3]

- F 5
- G 6
- H 7
- I 8
- J 9

- F 5
- G 6
- H 7
- I 8
- J 9

Vraag 13

[3]

Bereken die konsentrasie van die magnesiumkatione in die finale oplossing. Skryf die antwoord as 'n gewone desimale getal.

Die eerste desimale syfer van die getal is

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Question 13

[3]

Calculate the concentration of the magnesium cations in the final solution. Write the answer as normal decimal number.

The first decimal is the following:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Vrae 14 en 15 verwys na die volgende scenario:
25.00 cm³ van 'n 1.50 mol.dm⁻³ ammoniumfluoried-oplossing word oorgedra in 'n leë 750.00 cm³ volumetriese fles. Hierdie fles word opgemaak tot by die merk met gedistilleerde water, en goed geskud.

Questions 14 and 15 refer to the following scenario:
25.00 cm³ of a 1.50 mol.dm⁻³ ammonium fluoride solution was transferred into an empty 750.00 cm³ volumetric flask. This flask was made up to the mark with distilled water, and well mixed.

Vraag 14

[3]

Bereken die konsentrasie van die fluoriedione in die finale oplossing. Skryf die antwoord as 'n gewone desimale getal.

Die eerste desimale syfer van die getal is

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Question 14

[3]

Calculate the concentration of the fluoride ions in the final solution. Write the answer as normal decimal number.

The first decimal is the following:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Vraag 15

[3]

Bereken die massa ammoniumfluoried (in g) in die finale oplossing. Skryf die antwoord as 'n gewone desimale getal.

Die eerste desimale syfer van die getal is

- A 0
- B 1
- C 2
- D 3

Question 15

[3]

Calculate the mass of ammonium fluoride (in g) in the final solution. Write the answer as normal decimal number.

The first decimal is the following:

- A 0
- B 1
- C 2
- D 3

- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

- E 4
- F 5
- G 6
- H 7
- I 8
- J 9

Vraag 16

Watter een van die volgende is die elektronkonfigurasie van Cu^{2+} ?

- A $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- B $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{11}$
- C $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$
- D $2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- E $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$
- F $1s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- G $1s^1 2s^2 2p^6 3s^2 3p^6 3d^{10}$
- H $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$
- I $1s^1 2s^2 2p^6 3s^2 3p^6 3d^{10}$
- J Nie een van bogenoemde nie.

[2]

Question 16

Which one of the following is the electron configuration of Cu^{2+} ?

- A $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- B $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{11}$
- C $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$
- D $2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- E $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$
- F $1s^2 2p^6 3s^2 3p^6 4s^2 3d^9$
- G $1s^1 2s^2 2p^6 3s^2 3p^6 3d^{10}$
- H $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$
- I $1s^1 2s^2 2p^6 3s^2 3p^6 3d^{10}$
- J None of the above.

[2]

Vraag 17

Die totale aantal ongepaarde elektrone in 'n neutrale seleniatoom is die volgende:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J Nie een van bogenoemde nie.

[2]

Question 17

The total number of unpaired electrons in a neutral selenium atom is the following:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 5
- G 6
- H 7
- I 8
- J None of the above.

[2]

Vraag 18

Die totale aantal p-elektrone in 'n neutrale bariumatoom is die volgende:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 12
- G 6
- H 8
- I 56
- J Nie een van bogenoemde nie.

[2]

Question 18

The total number of p electrons in a neutral barium atom is the following:

- A 0
- B 1
- C 2
- D 3
- E 4
- F 12
- G 6
- H 8
- I 56
- J None of the above.

[2]

Vraag 19

Watter een van die volgende atome het die dieselfde elektronkonfigurasie as Ga^{3+} ?

- A Zn
- B Cu^+
- C Ni
- D Al^{3+}
- E In^{3+}
- F Ca
- G K
- H Ar
- I Ne
- J Nie een van bogenoemde nie.

Vraag 20

Watter een van die kwantumgetalle bepaal die vorm (tipe) orbitaal?

- A n
- B ℓ
- C m_ℓ
- D m_s
- E Nie een van bogenoemde nie.

Vraag 21

Watter een van die volgende versamelings kwantumgetalle is onmoontlik vir dieselfde elektron? (Die volgorde is hieronder is n, ℓ , m_ℓ en m_s)

- ~~A 1, 0, 0, $+\frac{1}{2}$~~
- ~~B 1, 0, 0, $-\frac{1}{2}$~~
- ~~C 2, 0, 0, $-\frac{1}{2}$~~
- ~~D 2, 1, 0, $-\frac{1}{2}$~~
- ~~E 2, 0, 0, $+\frac{1}{2}$~~
- ~~F 3, 0, 0, $-\frac{1}{2}$~~
- G 3, 2, (-3), $+\frac{1}{2}$
- ~~H 3, 2, -2, $+\frac{1}{2}$~~
- ~~I 3, 2, -2, $-\frac{1}{2}$~~
- J Nie een van bogenoemde nie.

Vrae 22 en 23 verwys na die valense elektrone van 'n kalsiumatoom.

Vraag 22

Die waarde van die hoofkwantumgetal van hierdie elektrone is

- A 1
- B 2
- C 3
- D 4
- E 20
- F -1
- G -2
- H 0

[2] Question 19**[2]**

Which one of the following atoms has the same electron configuration as Ga^{3+} ?

- A Zn
- B Cu^+
- C Ni
- D Al^{3+}
- E In^{3+}
- F Ca
- G K
- H Ar
- I Ne
- J None of the above.

[2] Question 20**[2]**

Which one of the quantum numbers determines the type (geometry) of orbital?

- A n
- B ℓ
- C m_ℓ
- D m_s
- E None of the above.

[2] Question 21**[2]**

Which one of the following sets of quantum numbers is impossible for the same electron? (The order below is n, ℓ , m_ℓ and m_s)

- A 1, 0, 0, $+\frac{1}{2}$
- B 1, 0, 0, $-\frac{1}{2}$
- C 2, 0, 0, $-\frac{1}{2}$
- D 2, 1, 0, $-\frac{1}{2}$
- E 2, 0, 0, $+\frac{1}{2}$
- F 3, 0, 0, $-\frac{1}{2}$
- G 3, 2, -3, $+\frac{1}{2}$
- H 3, 2, -2, $+\frac{1}{2}$
- I 3, 2, -2, $-\frac{1}{2}$
- J None of the above.

Questions 22 and 23 refer to the valance electrons of a calcium atom.

[2] Question 22**[2]**

The value of the main (principal) quantum number of these electrons is

- A 1
- B 2
- C 3
- D 4
- E 20
- F -1
- G -2
- H 0

- I $+1/2$ or $-1/2$
 J Nie een van bogenoemde nie.

Vraag 23

Die waarde(s) van die magnetiese kwantumgetal van hierdie elektrone is

- A 1
 B 2
 C 3
 D 4
 E 20
 F -1
 G -2
 H 0
 I $+1/2$ or $-1/2$
 J Nie een van bogenoemde nie.

Vraag 24

Watter een van die volgende pare elemente sluit twee metalloïede in?

- A Si, P
 B Ge, Sb
 C Ga, Ge
 D Al, Ge
 E B, Al
 F Ge, Sn
 G Sn, Sb
 H Sb, Po
 I Te, Po
 J Nie een van bogenoemde nie.

Vraag 25

Watter een van die volgende beskryf die tweede ionisasie-energie van aluminium?

- A $\text{Al} \rightarrow \text{Al}^{+2} + 2\text{e}^-$
 B $\text{Al} \rightarrow \text{Al}^+ + \text{e}^-$
 C $\text{Al} \rightarrow \text{Al}^{+3} + 3\text{e}^-$
 D $\text{Al}^+ \rightarrow \text{Al}^{+2} + \text{e}^-$
 E $\text{Al}^{+2} \rightarrow \text{Al}^{+3} + \text{e}^-$
 F $\text{Al}^{+3} \rightarrow \text{Al}^{+4} + \text{e}^-$
 G $\text{Al}^+ \rightarrow \text{Al}^{+3} + 2\text{e}^-$
 H $\text{Al}^{+2} + 2\text{e}^- \rightarrow \text{Al}$
 I $\text{Al}^{+3} + 2\text{e}^- \rightarrow \text{Al}^+$
 J Nie een van bogenoemde nie.

Vraag 26

Watter een van die volgende beskryf die elektronaffiniteit van aluminium?

- A $\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^-$
 B $\text{Al}^- \rightarrow \text{Al} + \text{e}^-$
 C $\text{Al}^{3-} \rightarrow \text{Al} + 3\text{e}^-$

- I $+1/2$ or $-1/2$
 J None of the above.

Question 23

The value(s) of the magnetic quantum number(s) of these electrons is/are

- A 1
 B 2
 C 3
 D 4
 E 20
 F -1
 G -2
 H 0
 I $+1/2$ or $-1/2$
 J None of the above.

Question 24

Which one of the following pairs of elements includes two metalloids?

- A Si, P
 B Ge, Sb
 C Ga, Ge
 D Al, Ge
 E B, Al
 F Ge, Sn
 G Sn, Sb
 H Sb, Po
 I Te, Po
 J None of the above.

Question 25

Which one of the following describes the second ionisation energy of aluminium?

- A $\text{Al} \rightarrow \text{Al}^{+2} + 2\text{e}^-$
 B $\text{Al} \rightarrow \text{Al}^+ + \text{e}^-$
 C $\text{Al} \rightarrow \text{Al}^{+3} + 3\text{e}^-$
 D $\text{Al}^+ \rightarrow \text{Al}^{+2} + \text{e}^-$
 E $\text{Al}^{+2} \rightarrow \text{Al}^{+3} + \text{e}^-$
 F $\text{Al}^{+3} \rightarrow \text{Al}^{+4} + \text{e}^-$
 G $\text{Al}^+ \rightarrow \text{Al}^{+3} + 2\text{e}^-$
 H $\text{Al}^{+2} + 2\text{e}^- \rightarrow \text{Al}$
 I $\text{Al}^{+3} + 2\text{e}^- \rightarrow \text{Al}^+$
 J None of the above.

Question 26

Which one of the following describes the electron affinity of aluminium?

- A $\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^-$
 B $\text{Al}^- \rightarrow \text{Al} + \text{e}^-$
 C $\text{Al}^{3-} \rightarrow \text{Al} + 3\text{e}^-$

- D $\text{Al}^{3+} + 3\text{e}^- \rightarrow \text{Al}$
 E $\text{Al}^+ + \text{e}^- \rightarrow \text{Al}$
 F $\text{Al} + \text{e}^- \rightarrow \text{Al}^-$
 G $\text{Al} + 2\text{e}^- \rightarrow \text{Al}^{2-}$
 H $\text{Al} + 3\text{e}^- \rightarrow \text{Al}^{3-}$
 I $\text{Al} + 5\text{e}^- \rightarrow \text{Al}^{5-}$
 J Nie een van bogenoemde nie.

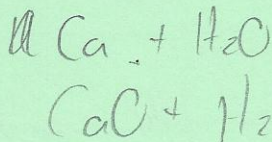
- D $\text{Al}^{3+} + 3\text{e}^- \rightarrow \text{Al}$
 E $\text{Al}^+ + \text{e}^- \rightarrow \text{Al}$
 F $\text{Al} + \text{e}^- \rightarrow \text{Al}^-$
 G $\text{Al} + 2\text{e}^- \rightarrow \text{Al}^{2-}$
 H $\text{Al} + 3\text{e}^- \rightarrow \text{Al}^{3-}$
 I $\text{Al} + 5\text{e}^- \rightarrow \text{Al}^{5-}$
 J None of the above.

Vraag 27

[2]

Die volgende vorm wanneer kalsium met water reageer:

- A $\text{H}_2(\text{g})$
 B $\text{H}_3\text{O}^+(\text{aq})$
 C $\text{H}^+(\text{aq})$
 D $\text{O}_2(\text{g})$
 E $\text{O}_3(\text{g})$
 F $\text{Ca}^+(\text{aq})$
 G $\text{H}^-(\text{aq})$
 H $\text{O}^-(\text{aq})$
 I $\text{H}_2\text{O}_2(\text{aq})$
 J Nie een van bogenoemde nie.

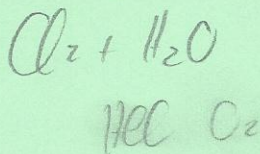


Vraag 28

[2]

Die volgende vorm wanneer chloorgas met water reageer:

- A $\text{H}_2(\text{g})$
 B $\text{Cl}(\text{g})$
 C $\text{Cl}^-(\text{aq})$
 D $\text{HOCl}(\text{aq})$
 E $\text{O}_2(\text{g})$
 F $\text{O}_3(\text{g})$
 G $\text{OH}^-(\text{aq})$
 H $\text{HClO}_4(\text{aq})$
 I $\text{H}_2\text{O}_2(\text{aq})$
 J Nie een van bogenoemde nie.



Vraag 29

[2]

Beskou die volgende reeks van neutrale atome:

Li, Sb, Te, O, B, Br

Die kleinste en grootste (respektiewelik) atome in hierdie reeks is:

- A Li, Sb
 B Li, Br
 C Li, Te
 D B, Sb
 E Br, Li
 F Te, Li
 G O, Sb
 H O, Te
 I B, Te
 J Nie een van bogenoemde nie.

Question 27

[2]

The following forms when calcium metal reacts with water:

- A $\text{H}_2(\text{g})$
 B $\text{H}_3\text{O}^+(\text{aq})$
 C $\text{H}^+(\text{aq})$
 D $\text{O}_2(\text{g})$
 E $\text{O}_3(\text{g})$
 F $\text{Ca}^+(\text{aq})$
 G $\text{H}^-(\text{aq})$
 H $\text{O}^-(\text{aq})$
 I $\text{H}_2\text{O}_2(\text{aq})$
 J None of the above.

Question 28

[2]

The following forms when chlorine gas reacts with water:

- A $\text{H}_2(\text{g})$
 B $\text{Cl}(\text{g})$
 C $\text{Cl}^-(\text{aq})$
 D $\text{HOCl}(\text{aq})$
 E $\text{O}_2(\text{g})$
 F $\text{O}_3(\text{g})$
 G $\text{OH}^-(\text{aq})$
 H $\text{HClO}_4(\text{aq})$
 I $\text{H}_2\text{O}_2(\text{aq})$
 J None of the above.

Question 29

[2]

Consider the following series of neutral atoms:

Li, Sb, Te, O, B, Br

The smallest and largest (respectively) atoms in this series are:

- A Li, Sb
 B Li, Br
 C Li, Te
 D B, Sb
 E Br, Li
 F Te, Li
 G O, Sb
 H O, Te
 I B, Te
 J None of the above.

**DIE PERIODIEKE TABEL VAN DIE ELEMENTE
THE PERIODIC TABLE OF THE ELEMENTS**

| | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|------------------|-------------------|-------------------|
| 1 H 1.01 | | | | | | | | | | | | | | | | | 2 He 4.00 | | | | |
| 3 Li 6.94 | 4 Be 9.01 | | | | | | | | | | | | | | | 5 B 10.81 | 6 C 12.01 | 7 N 14.01 | 8 O 16.00 | 9 F 19.00 | 10 Ne 20.18 |
| 11 Na 22.99 | 12 Mg 24.31 | | | | | | | | | | | | | | | 13 Al 26.98 | 14 Si 28.09 | 15 P 30.97 | 16 S 32.07 | 17 Cl 35.45 | 18 Ar 39.95 |
| 19 K 39.10 | 20 Ca 40.01 | 21 Sc 44.96 | 22 Ti 47.87 | 23 V 50.95 | 24 Cr 52.00 | 25 Mn 54.94 | 26 Fe 55.85 | 27 Co 58.93 | 28 Ni 58.69 | 29 Cu 63.55 | 30 Zn 65.39 | 31 Ga 69.72 | 32 Ge 72.61 | 33 As 74.92 | 34 Se 78.96 | 35 Br 79.90 | 36 Kr 83.80 | | | | |
| 37 Rb 85.47 | 38 Sr 87.62 | 39 Y 88.91 | 40 Zr 91.22 | 41 Nb 92.91 | 42 Mo 95.94 | 43 Tc 98.91 | 44 Ru 101.07 | 45 Rh 102.91 | 46 Pd 106.42 | 47 Ag 107.87 | 48 Cd 112.41 | 49 In 114.82 | 50 Sn 118.71 | 51 Sb 121.76 | 52 Te 127.60 | 53 I 126.90 | 54 Xe 131.29 | | | | |
| 55 Cs 132.91 | 56 Ba 137.33 | 57 La 138.91 | 72 Hf 178.49 | 73 Ta 180.95 | 74 W 183.84 | 75 Re 186.21 | 76 Os 190.23 | 77 Ir 192.22 | 78 Pt 195.08 | 79 Au 196.97 | 80 Hg 200.59 | 81 Tl 204.38 | 82 Pb 207.20 | 83 Bi 208.98 | 84 Po 208.98 | 85 At 209.99 | 86 Rn 222.01 | | | | |
| 87 Fr 223.02 | 88 Ra 226.03 | 89 Ac 227.03 | 104 Rf 261.11 | 105 Db 262.11 | 106 Sg 263.12 | 107 Bh 262.12 | 108 Hs 265 | 109 Mt 266 | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|--|
| 58 Ce 140.12 | 59 Pr 140.91 | 60 Nd 144.24 | 61 Pm 144.91 | 62 Sm 150.36 | 63 Eu 151.97 | 64 Gd 157.25 | 65 Tb 158.93 | 66 Dy 162.50 | 67 Ho 164.93 | 68 Er 167.26 | 69 Tm 168.93 | 70 Yb 173.94 | 71 Lu 174.97 | |
| 90 Th 232.04 | 91 Pa 231.04 | 92 U 238.03 | 93 Np 237.05 | 94 Pu 244.06 | 95 Am 243.06 | 96 Cm 247.07 | 97 Bk 247.07 | 98 Cf 251.08 | 99 Es 252.08 | 100 Fm 257.10 | 101 Md 258.10 | 102 No 259.10 | 103 Lr 262.11 | |

**ELEKTRONEGATIWITEIT-WAARDES VAN DIE ELEMENTE
VOLGENS DIE PAULING-SKAAL
ELECTRONEGATIVITY VALUES OF THE ELEMENTS
ACCORDING TO THE PAULING SCALE**

| | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|----|
| H 2.1 | | | | | | | | | | | | | | | | | He | | | | |
| Li 1.0 | Be 1.5 | | | | | | | | | | | | | | | B 2.0 | C 2.5 | N 3.0 | O 3.5 | F 4.0 | Ne |
| Na 0.9 | Mg 1.2 | | | | | | | | | | | | | | | Al 1.5 | Si 1.8 | P 2.1 | S 2.5 | Cl 3.0 | Ar |
| K 0.8 | Ca 1.0 | Sc 1.3 | Ti 1.5 | V 1.6 | Cr 1.6 | Mn 1.5 | Fe 1.8 | Co 1.9 | Ni 1.8 | Cu 1.9 | Zn 1.6 | Ga 1.6 | Ge 1.8 | As 2.0 | Se 2.4 | Br 2.8 | Kr 3.0 | | | | |
| Rb 0.8 | Sr 1.0 | Y 1.2 | Zr 1.4 | Nb 1.6 | Mo 1.8 | Tc 1.9 | Ru 2.2 | Rh 2.2 | Pd 2.2 | Ag 1.9 | Cd 1.7 | In 1.7 | Sn 1.8 | Sb 1.9 | Te 2.1 | I 2.5 | Xe 2.6 | | | | |
| Cs 0.7 | Ba 0.9 | | Hf 1.3 | Ta 1.5 | W 1.7 | Re 1.9 | Os 2.2 | Ir 2.2 | Pt 2.2 | Au 2.4 | Hg 1.9 | Tl 1.8 | Pb 1.9 | Bi 1.9 | Po 2.0 | At 2.2 | Rn | | | | |
| Fr 0.7 | Ra 0.9 | | | | | | | | | | | | | | | | | | | | |

- Aktiiviteitsreeks van
Metale in Waterige
Oplossing
Activity Series of Metals in
Aqueous Solution**
- Li
 - K
 - Ba
 - Ca
 - Na
 - Mg
 - Al
 - Mn
 - Zn
 - Cr
 - Fe
 - Co
 - Ni
 - Sn
 - Pb
 - H₂**
 - Cu
 - Ag
 - Hg
 - Pt
 - Au

$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$

$1 \text{ amu} = 1.66054 \times 10^{-24} \text{ g}$