basic education

Department:

[redacted]

NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SERTIFIKAAT

GRADE/*GRAAD* 11

PHYSICAL SCIENCES: CHEMISTRY (P2)
FISIESE WETENSKAPPE: CHEMIE (V2)

EXEMPLAR/*MODEL* 2013

MEMORANDUM

MARKS/*PUNTE*: 150

This memorandum consists of 11 pages.
Hierdie memorandum bestaan uit 11 bladsye.

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10.3

10.3.1 $c = \frac{n}{V}$ ✓ OR/*OF* n=cV

$n_{base/basis}$ = (0,025 x 0,05)
= 1,25 x 10^{-3} mol ✓

(2)

10.3.2 1 mol base reacts with 2 mol acid / *1 mol basis reageer met 2 mol suur*
Mole acid/*Mol suur* = 2 x 1,25 x 10^{-3}
= 2,5x 10^{-3} mol✓ (1)

10.3.3 $c = \frac{n}{V}$ OR n=cV

$= \frac{2,5x\,10^{-3}}{0,04}$ ✓

= 6,25 x 10^{-2} mol·dm^{-3}✓ (2)

[11]

QUESTION 11/*VRAAG 11*

11.1 Loss of electrons./*Verlies aan elektrone*. ✓✓ (2)

11.2

11.2.1 Zn ✓ (1)

11.2.2 CO ✓
Oxidation number of C increases from +2 to +4 ✓
Thus C is oxidised ✓ and acts as reducing agent.
Oksidasiegetal van C neem toe van +2 na +4.
Dus word C geoksideer en tree as reduseermiddel op. (3)

11.3 $Cu \rightarrow Cu^{2+} + 2e^-$ ✓ (oxidation/*oksidasie*) x3
$NO_3^- + 4H^+ + 3e^- \rightarrow NO + 2H_2O$ ✓ (reduction/*reduksie*) x2
$3Cu + 8H^+ + 2NO_3^-$ ✓ $\rightarrow 3Cu^{2+} + 2NO + 4H_2O$ ✓ Bal. ✓ (5)

[11]

QUESTION 12/*VRAAG 12*

12.1

12.1.1 $\underline{4}Au + \underline{8}NaCN + O_2 + 2H_2O \rightarrow 4NaAu(CN)_2 + 4NaOH$ (2)

12.1.2 Cyanidation/*Sianidering* ✓ (1)

12.1.3 Redox/*Redoks* ✓ (1)

12.1.4 Basic/*Basies* ✓
NaOH is a product of the reaction between gold ore and NaCN. ✓ (2)

12.1.5 **ANY ONE/*ENIGE EEN*:**

- Pollution and poisoning caused by leaching of chemicals used during extraction into water or atmosphere. ✓
  Besoedeling weens insyfering van chemikalieë gebruik tydens ontginning in water of atmosfeer.
- Cyanide is known as a poison that is lethal to humans and animals.
  Sianied is bekend as 'n gif en dodelik vir mens en dier.
- Mining disturbs the soil around the mine and can cause erosion.
  Mynbou versteur die grond rondom die myn en veroorsaak erosie. (1)

12.2

12.2.1 Precipitation/*Presipitasie* ✓ (1)

12.2.2 Transition metal/*Oorgangsmetaal* ✓ (1)

12.2.3 More reactive/*Meer reaktief* ✓ (1)

12.3

12.3.1 Creates jobs/*Skep we*rk ✓
A lot of money can be generated from gold resources (economy of the country grows)./*Baie geld kan uit goudbronne gegenereer word (ekonomie van land groei).* ✓ (2)

12.3.2 **ANY TWO/*ENIGE TWEE***

- Destruction of natural ecosystem. ✓
  Vernietiging van natuurlike ekosisteem.
- Moving of people from areas where they have lived for a long time.
  Verskuiwing van mense uit gebiede waar hulle reeds lank woon.
- Mining can make the surrounding land unstable and unsafe to build on.
  Mynbou kan die omliggende gebied onstabiel maak en onveilig om op te bou.
- Pollution as a result of energy needed for the extraction of the metal. ✓
  Besoedeling as gevolg van energie benodig vir ontginning van metaal.
- The destruction of the surrounding landscape. ✓
  Vernietiging van omliggende landskap. (2)

12.4 **ANY TWO/*ENIGE TWEE*:**

- Size of the ore body. ✓✓
  Grootte van ertsneerslag.
- Amount of gold in the ore. ✓✓
  Hoeveelheid goud in erts.
- Depth at which the gold is located influences the mine cost.
  Diepte waarop goud voorkom beïnvloed koste van myn.
- Price of gold compared to the cost of mining.
  Prys van goud in vergelyking met koste van mynbou.
- Infrastructure available (housing for employees, roads, water, electricity, school, hospitals, etc).
  Beskikbare infrastruktuur (behuising vir werkers, paaie, water, elektrisiteit, skole, hospitale, ens.)
- Cost of establishing infrastructure.
  Koste van infrastruktuurontwikkeling. (4)

[18]

TOTAL/*TOTAAL*: 150

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