

MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN PUBLIC HEALTH WITH INFORMATION TECHNOLOGY (CITY CAMPUS)

SCH 102: BASIC INORGANIC CHEMISTRY

Date: 2nd August, 2013

Time: 11.00 a.m. - 1.00 p.m.

INSTRUCTIONS

- · Answer ALL questions.
- Periodic Table is attached.

Q1(a) N	lame each of the following compounds:	
i.	KH_2PO_4	1Mk
ii.	$HBr_{(g)}$	1Mk
iii.	HBr (in water)	1Mk
iv.	NH4NO2	1Mk
v.	AI(OH) ₃	1Mk
vi.	KMnO ₄	1Mk
vii.	KNH ₄ SO ₄	1Mk
(b) Writ	te the formulae for the following compounds:	
i.	Potassium sulphide	1Mk
ii.	Calcium hydrogen phosphate	1Mk
iii.	Boron trichloride	1Mk
iv.	Strontium chlorite	1Mk
v.	Ammonium sulphate	1Mk
vi.	Silver perchlorate	1Mk
vii.	Sodium hydrogen sulphide	1Mk
Q2. (a)(i) Group the following compounds as either ionic or mole	ecular:
	SiCl ₄ , LiF, NaBr, BaF ₂ , CCl ₄ , ICl, CsCl.	4Mks
(3Mks	
(iii) Briefly explain how a covalent bond is formed	2Mks
(b) Wri	te the formulae for the following ionic compounds:	
(i) Copper bromide (Containing Cu + ion)	
(ii) Manganese oxide (Containing Mn3+ ion)	
(iii) Magnesium phosphate (Containing the PO ₄ 3° ion)	5Mks

Q3 (a) (i) Explain the meaning of each term in the symbol AX 3Mks Give the number of protons and neutrons in the nuclear of each of the following. atoms:

A	65 00
(iii)	65Cu
4447	2904

1Mk

 $(iii)_{24}^{52}Cr$

1Mk

(iv) 60 Co

1Mk

 $(v)^{107}_{47}Ag$

1Mk

(b) (i) Copy and fill in the blanks in the table below:

Symbol		54Fe ²⁺	545		
Protons	5			79	86
Neutrons	6	1	16	117	136
Electrons	5		18	79	
Net charge			3-		0

3Mks

(ii) Which elements are most likely to form ionic compounds?

2Mks

(iii) Which metallic elements are most likely to form cations with different 2Mks charges?

Q4 (a)(i) What is stoichiometry?

1Mk

(ii) Give a schematic diagram of a Mass Spectrometer

4Mks

(iii) Briefly explain how mass spectrometer is used to determine the 3Mks

atomic mass (weight) of an element

(i)What is an isotope? (b)

1Mk

(ii) Briefly explain how the mass spectrometer is used to determine the 2Mks isotopic composition of an element

(iii) The element Magnesium (Mg) has three stable isotopes with the following masses and abundances:

Isotope	Mass (amu)	Abundance
24 _{Mg}	23.9850	78.99%
25 _{Mg}	24.9858	10.00%
26 _{Mg}	25.9826	11.01%

Calculate the atomic weight of Magnesium that would be listed on the periodic table.

3Mks

Q5 (a)(i) What is a mole?

2Mks

(ii) Calculate the number of oxygen molecules in 35.5g of O2

2Mks

(iii) Calculate the mass of 12.3 moles of SO3 molecules.

2Mks

(b)(i) What is the difference between the empirical and molecular formulae of a compound?

4 Mks

(ii) A compound containing only sulphur and nitrogen is 69.9% sulphur by mass. The molar mass of the compound is 184.

Calculate

(i) the empirical formula

2mks

(ii) molecular formula, of the compound.

2mks

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