



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF MEDICAL SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
MEDICAL LABORATORY SCIENCES
BMLS 14J

AML 4107 : FUNDAMENTALS OF INORGANIC CHEMISTRY

SEMESTER EXAMINATION

APRIL 2014 SERIES

2 HOURS

Instructions to candidates:

This paper consists of **FIVE** questions.
Answer questions **ONE** and any other **TWO** .

QUESTION ONE

- a) Define the following terms clearly and concisely.
- (i) Mixture (2 marks)
 - (ii) Element (2 marks)
- b) Explain the difference between
- (i) Mass and weight (2 marks)
 - (ii) Atomic weight and atomic mass unit (4 marks)
 - (iii) Nuclear fission and nuclear fusion (2 marks)
- c) 24cm^3 of a solution of NaOH required 28cm^3 of one molar H_2SO_4 to neutralize it. Calculate the molarity NaOH (4 marks)
- d) (i) State the quantum theory (2 marks)
- (ii) A green line of wavelength 486nm is observed in the emission spectrum of Hydrogen. Calculate the energy of one photon of this green light. (3 marks)
- e) (i) Define the terms empirical formula (2 marks)
- (ii) A common product found in nearly every kitchen contains 27.37% sodium, 1.20% hydrogen, 14.30% carbon , and 57.14% oxygen. Find the empirical formula of the compound. (5 marks)

QUESTION TWO

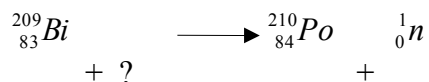
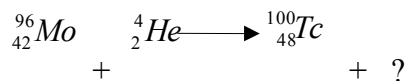
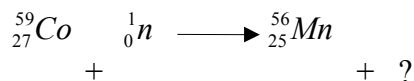
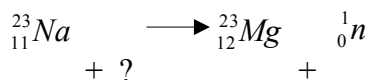
- a) State the following rules
- (i) Hund's rule (3 marks)
 - (ii) Aufbau rule (3 marks)
 - (iii) Pauli exclusion principle (3 marks)
- b) Write the electronic configuration of;
- (i) ${}^{94}\text{W}$
 - (ii) ${}^{41}\text{Nb}$
 - (iii) ${}^{80}\text{Hg}^{3+}$
- c) Draw the emission spectra of hydrogen atom indicating all the line series. (6 marks)
- (5 marks)

QUESTION THREE

- a) Describe the general trends in the following properties across the period
- (i) Metallic character (4 marks)
 - (ii) Electron affinity (4 marks)
 - (iii) Atomic radii (4 marks)
- b) Give the differences between ionic compounds and covalent compound (8 marks)

QUESTION FOUR

- a) Define the following terms :
- (i) Nuclide (2 marks)
 - (ii) Isotope (2 marks)
- b) Using examples, explain four factors that affect the stability of a nuclide. (8 marks)
- c) Fill in the missing symbols in the following nuclear bombardment reactions.

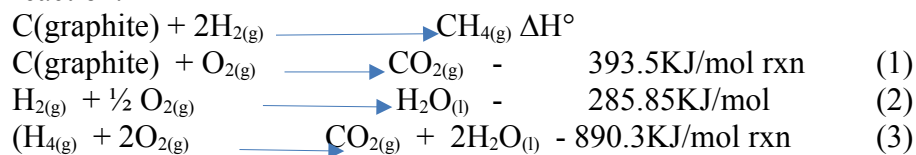


(8 marks)

QUESTION FIVE

a) State the Hess's law (2 marks)

b) Use the thermochemical equations shown here to determine $\Delta H^{\circ}_{\text{rxn}}$ at 20°C for the following reaction.



(6 marks)

c) State and discuss the three intermolecular forces that exist in chemical bonding . (12 marks)