

NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY,
JABI - ABUJA.

FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCE
2023 2 EXAMINATIONS

COURSE CODE: CHM303
COURSE TITLE: INORGANIC CHEMISTRY III
TIME: 2½ HOURS
INSTRUCTION: Answer question one and any other four questions.

QUESTION ONE

(1a) Explain briefly: (i) Why no compounds of He and Ne are known (3 marks) (ii) Why the tendency to form clathrates increase down the nobles gas group (2 marks).

(1bi) What are lanthanides and actinides? Why are they so called? (3 marks)

(1bii) Write the electronic configurations of the following species: Sc^{3+} , Co^{2+} , Y, Ni. (6 marks)

(1c) Discuss the relevance of beneficiation of ores in the processing of metals from their ores. (4 marks)

(1d) Complete the following chemical reactions:

i. $Na_2SO_3(aq) + 2HCl \rightarrow$ (2 marks)

ii. $2Na(s) + 2H_2O(l) \rightarrow$ (2 marks)

QUESTION TWO

(2a) The electronic configuration of chromium is $[Ar]3d^54s^1$; and not $[Ar]3d^44s^2$. Explain. (3 marks)

(2b) List ANY TWO important methods of beneficiation; give an example each of ores beneficiated by each method. (4 marks)

(2c) Discuss the chemical unreactivity of noble gases. (5 marks)