THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

SEPTEMBER – DECEMBER 2019 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF CHEMISTRY

REGULAR PROGRAMME

CHEM 200: DESCRIPTIVE INORGANIC CHEMISTRY OF S AND P BLOCK ELEMENTS

Date: DECEMBER 2019	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other Two Questions	

Q1. a) i). Define electron affinity. **(2 marks)**

ii). Explain three factors which influence its magnitude **(8 marks)**

b) Explain the difference in the first ionization potential between aluminum and magnesium

(4 marks)

c) Why is helium in group zero and yet is not a p-block element

(3 marks)

d)

i) Using five similarities and differences as examples compare and contrast the chemistry of lithium and sodium

(5 marks)

ii) Suggest reasons for and against the inclusion of hydrogen in the main groups of the periodic table

(4 marks)

iii) Chlorine has a higher electron affinity than fluorine and yet fluorine is smaller than chlorine. Explain

(3 marks)

iv) The first ionization energy of the transition elements is reasonably constant. Explain

(3marks)

Q2. a) Discuss the chemistry of group II elements. In your discussion show the main differences between Beryllium and the rest of the elements in the group **(20 marks)**

Q3. a) i) Explain the electro-positivity and the metallic character along period III elements.

(4 marks)

ii) Discuss two differences in the chemistry of Boron from the rest of group III elements

(4 marks)

b) i). Draw the structure of solid anhydrous aluminium (III) chloride and explain its chemical bonding

(4 marks)

ii) Anhydrous aluminum (III) chloride fumes in air. Explain this observation

(4 marks)

iii) Boric acid is weaker than hydrochloric acid. Explain this observation.

(4 marks)

Q4. a) Describe the location and periodic properties of s and p blocks elements in relation to:

i) Atomic radii,
ii) Ionization energy,
iii) Electron affinity,
iv) Electronegativity

(20 marks)

Q5. a) Describe the extraction, properties and uses of sodium

(20 marks)

END