



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCE
DEPARTMENT OF PURE AND APPLIED SCIENCE
2020_1 EXAMINATION

COURSE CODE: CHM426

COURSE TITLE: CHEMISTRY OF LANTHANIDES AND ACTINIDES

CREDIT: 2 Units

TIME ALLOWED: 2 Hours

INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

Question 1

- List any four general physical properties of the lanthanide elements (4 marks)
- State any 4 general chemical properties of lanthanides (6 marks)
- Discuss the electronic configuration of lanthanide elements (6 marks)
- Explain the stability of the various oxidation states of lanthanides (5 marks)
- Explain what happened when lanthanide absorbed CO_2 (4 marks)

Total = 25 marks

Question 2

- Describe the uses of lanthanides complexes in the medical industries (5 marks)
- Discuss the metallic properties of lanthanides (5 marks)
- Explain the chemistry behind the formation of uranium oxides (5 marks)

Question 3

Discuss the followings;

- Account for the similarities in properties between lanthanides and yttrium (5 marks)
- Compare and contrast the properties of lanthanides and actinides (10 marks)

Question 4

- List the principal ore and hence, highlight two extraction or purification methods for lanthanides (7 marks)
- Discuss briefly three effects of the lanthanide contraction (5 marks)
- show the equation for the combustion of 2 lanthanide metals (3 marks)

Question 5

- Discuss on the magnetic and spectral properties of the lanthanide elements (5 marks)
- Discuss the coordination number and stereochemistry of the lanthanide elements (5 marks)
- Explain the concept of lanthanide contraction (5 marks)