NATIONAL OPEN UNVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
OCTOBER/NOVEMBER 2019_2 EXAMINATION

COURSE CODE: CHM 424
COURSE TITLE: NON AQUEOUS SOLVENTS
CREDIT: 2 UNIT
TIME ALLOWED: 2 HOURS
Instruction: Answer **question 1** and any other three.

Q1a What is induced dipole induced interaction **(5 marks)**
b. Briefly discuss the effect of dielectric constant and solubility on Arsenic chloride. **(4 marks)**
c. Outline any two advantages of liquid ammonia as solvent over water **(4 marks)**
d. Give properties of phosphorylchloride **(2 marks)**
e. Highlight the general characteristics of polarprotic solvent. Give two examples? **(4 marks)**
f. Write the equation for the following reaction of $POCl_3$, autoionization, reaction with triethylmine and with IronIIIchloride. **(6 marks)**

2a. Enumerate the characters of dinitrogentetroxide that can be used as medium for conducting chemical reactions **(5 marks)**
b. Give the physical properties of liquid N_2O_4 **(5 marks)**
c. With typical equations represent the reactions of N_2O_4 with lithium, sodium, aluminum and zinc nitrate **(5 marks)**

3a. With appropriate equations represent the solvolytic reactions of N_2O_4 with $(C_2H_5)_2NH_2Cl$, MCl, $(MgCH_2O)_6Cl_2$, $(Mg(ClO_4)_2)$ and Li_2CO_3 **(5 marks)**
b. Using suitable equations represent the adducts formation of N_2O_4 with inorganic compounds and comment on the stability of the product.

(5 marks)

c. Enumerate the special features of liquid SO_2 as solvent **(5 marks)**

4a. Draw the resonance structure of SO_2 **(2 marks)**

b. How does SO_2 undergo autoionization? **(6 marks)**

c. With appropriate equations represent the neutralization reactions of SO_2 **(7 marks).**

5a. What is metathetical reactions? **(6 marks)**

b. How is amphoteric reactions in liquid sulphate analogous to amphoteric substance in water ? **(6 marks)**

c. With equations only, represent the complex reaction of antimony chloride **(3 marks).**