NATIONAL OPEN UNVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
2020_1 EXAMINATION

CHM 424 - NON AQUEOUS SOLVENTS
CREDIT UNIT: 2
INSTRUCTION: Answer question 1 and any other three questions.
Duration: 2 hours

QUESTION 1

a. Give properties of phosphoryl chloride **(6 mks)**

b. What are the general characteristics of polarprotic solvent? **(6 mks)**

c. Write the equation for the following reaction of $POCl_3$, autoionization, reaction with triethylmine and with Iron (iii) chloride. **(8 mks)**

d. Enumerate demerits of using water as solvent. **5 mks**

QUESTION 2

a. Enumerate the characters of dinitrogentetroxide that can be used as medium for conducting chemical reactions **(8 mks)**

b. Give the physical properties of liquid N_2O_4 **(7 mks)**

QUESTION 3

a. With typical equations represent the reactions of N_2O_4 with lithium, sodium, aluminum and zinc nitrate **(8 mks)**

b. 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 **(7 mks)**

QUESTION 4

a. Using suitable equations represent the adducts formation of N_2O_4 with inorganic compounds and comment of the stability of the product. **(8 mks)**

b. Enumerate the special features of liquid SO_2 as solvent **"(5 mks)**

c. Draw the resonance structure of SO_2 **(2 mks)**

QUESTION 5

a. how does SO_2 undergo autoionization **(7 mks)**

8. With appropriate equations represent the neutralization reactions of SO_2 **(8 mks).**