

**NATIONAL OPEN UNVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE & APPLIED SCIENCES**

**NOV. 2019\_ EXAMINATION QUESTIONS**

**COURSE CODE: CHM 424**

**COURSE TITLE: NON AQUEOUS SOLVENTS**

**COURSE UNIT: 2**

**INSTRUCTION: Answer question 1 and any other three questions.**

**DURATION: 2 hours**

**Question 1**

1a. State five advantages of using water over other solvent **(2 marks)**

b. Enumerate demerits of using water as solvent **(3 marks)**

c. With suitable equation discuss the Redox reaction of liquid SO2 **(2 ½ marks)**

d. What are the limitations of Arrehenius definition of acid **(5 marks)**

e. What is autoionization of solvent? Take H2O, HF, 3HF NH3 and H2SO4 as examples of solvent **(3.5 marks)**

f. Give the various classification of solvents **(5 marks)**

g. Give two disadvantages of using liquid ammonia as solvent **(2 marks)**

h. With appropriate equations represent the following reactions of ethanoic acids: Amphoteric and Complex reaction **(2 marks)**

**Question 2**

2a Present classification of non-aqueous solvents based on ability to coordinate with cation and anion. **(4 marks)**

b Explain the concept of electronegativity of an atom using appropriate illustration

**(6 marks)**

c, With appropriate diagrams, illustrate the concept of dipole moment.**(5 marks)**

**Question 3**

3a. Define solvation **(3 marks)**

b. Discuss the stages/steps involve in solvation **(6 marks)**

**c.** What is solution? **(6 marks)**

**Question 4**

4a. What is charge dipole interaction? **(5 marks)**

b. Discuss dipole-induced dipole interaction **(5 marks)**

c. What is induced dipole induced diapole interaction **(5 marks)**

**Question 5**

5a. With typical equations, represent three notable reactions between silverphosphate and nitrosylchloride **(3 marks)**

b. Highlight the typical properties of dipole-dipole (Keesom) interaction **(6 marks)**

c. With balanced equations, give the reactions between nitrosyl chloride and the following; H2SO4, AgSCN and M2O(CO)6 **(6 marks)**