



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
2021_2 EXAMINATIONS

COURSE: CHM 424- NON AQUEOUS SOLVENTS TIME ALLOWED: 2 HOURS
INSTRUCTION: ANSWER QUESTION ONE (1) AND ANY OTHER THREE (3) QUESTIONS

1. a. Explain why water is the best solvent for ionic compounds rather than liquid ammonia and sulphur (IV) oxide. **[6 marks]**
b. i. Define 'Trouton constant' and state it is significant in non-aqueous chemistry **[4 marks]**
ii. Give four reasons why Arrhenius definition of acid is defective **[8 marks]**
c. i. Outline four types of interactions that are necessary for the formation of a solution. **[4 marks]**
ii. Briefly explain the oxidising properties of HNO_3 in both aqueous and non-aqueous medium **[3 marks]**
2. a. Give the condition under which the solvent 'levelling' effect of ammonia better than that of water **[6 marks]**
b. List seven physical properties of solvents **[7 marks]**
c. What are non-aqueous solvents? **[2 marks]**
3. a. List and explain the three types of liquid that can serve as solvents. **[9 marks]**
b. Outline three general characteristics of polar protic solvents **[3 marks]**
c. List three general characteristics of polar aprotic solvents **[3 marks]**
4. a. Outline five reasons for choosing water as a solvent in inorganic chemistry **[5 marks]**
b. What are the factors that make the choice of water as solvent disadvantageous? **[6 marks]**
c. Define acid and base according to Franklin's 'solvent-system concept' **[4 marks]**
5. a. i. State the concept of 'levelling effect' **[3 marks]**
ii. Outline three general characteristics of polar protic solvents **[3 marks]**
b. With examples, differentiate between ionisable solvents and nonionisable solvents **[6 marks]**
c. Outline three types of interaction that occurs during formation of solution **[3 marks]**