



CRAWFORD UNIVERSITY
COLLEGE OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF PHYSICAL AND EARTH SCIENCES
INDUSTRIAL CHEMISTRY PROGRAMME
HARMATTAN SEMESTER EXAMINATIONS 2013/2014 SESSION

COURSE CODE: ICH 429

COURSE TITLE: CHEMISTRY OF NON-AQUEOUS SOLVENTS UNIT 1

TIME ALLOWED: 2 HRS

DATE: FEBRUARY, 2014

ANSWER ANY THREE (3) QUESTIONS

- With equations, show the four different ways of formation of basic solutions with tetraoxosulphate (IV) acid (H_2SO_4).
 - What are the major applications of dinitrogen tetroxide (N_2O_4) as a solvent?
 - What effect has the replacement of the OH^- in the structure of H_2SO_4 with F^- as in HSO_3F (Fluorosulphuric acid).
 - Define the term 'levelling effect' of solvents.
- Describe the important factors that favour the use of H_2SO_4 as a solvent in the laboratory.
 - Explain the use of super acid media as a non-aqueous solvent in the laboratory.
 - What features characterize the blue solution of an alkali metal in liquid ammonia?
 - What are protogenic solvents?
- What are the properties of sulphur (IV) oxide as a solvent?
 - Describe the features of Aprotic solvent.
 - What are the ionic species present in liquid sulphur (IV) oxide upon ionization?
 - What factors favour the use of anhydrous ethanoic acid (CH_3COOH) as a solvent?
- On what basis does the acid-base behaviour of non-aqueous solvents depend?
 - Discuss the three factors that favour the dissolution of metals in liquid ammonia.
 - Explain the important factors that are responsible for the dissolution properties of liquid Ammonia.
 - What are amphiprotic solvents?
- What are the main uses of non-aqueous solvents in both industry and laboratory?
 - Show the autoprotolysis of the following solvent:
i. CH_3COOH ii. HSO_3F iii. H_2O iv. H_2SO_4 v. NH_3
 - What are protophylic solvent? Give three (3) examples.
 - Highlight the properties of non-aqueous solvents which make them more relevant in application than the universal solvent – (water).