

Mid-West University
Examinations Management Office

Birendranagar, Surkhet

End Semester (Alternative/Physical) Examinations -2078

Bachelor level/ B.Sc / 2nd Semester

Time: 3hrs

Full Marks : 60

Pass Marks : 30

Subject : Basic Chemistry II(CHE325)

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Inorganic Chemistry

Attempt all the question

- Differentiate between ionic and covalent bond. Show your familiarity with Fajan's rule. Define dipole moments with respect to suitable example. [5]
 - What is Born Haber cycle? Explain the experimental determination of lattice energy. From following data, calculate the lattice energy. [5]

i) $\text{Na} + \frac{1}{2} \text{Cl}_2 = \text{NaCl}$	$\Delta H_f = -410 \text{ kJ per mole}$
ii) $\text{Na(s)} = \text{Na}$	$\Delta H_{\text{sub}} = 108.8 \text{ kJ per mole}$
iii) $\frac{1}{2} \text{Cl}_2 = \text{Cl}$	$\Delta_{\text{diss}} = 242.7 \text{ kJ per mole}$
iv) $\text{Cl} = \text{Cl}^-$	$E.A = -368.2 \text{ kJ per mole}$
v) $\text{Na} = \text{Na}^+$	$I.E = 493.7 \text{ kJ per mole}$
- Define dipole moments with respect to suitable example. Define the terms: bond length and bond strength. Predict the structure of water according to VSEPR theory. [5]
 - Define hybridization? Explain its types with suitable example? [5]

Organic Chemistry

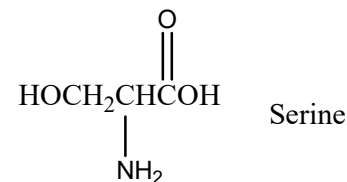
Attempt all the question

- What are optical isomers? Give an example of simplest alkane which exhibits optical activity. Define specific rotation. What is meant by the specific rotation of an optical isomer is (+)-62°? Predict, through mechanism, the predominant product if neopentyl bromide reacts with aqueous NaOH by S_N1 reaction. [5]

b) Illustrate CIP rule providing suitable examples. [5]

OR

- Draw Fischer projection of both enantiomers of the amino acid Serine. Tell which of your structures is *S* and which is *R*. [5]

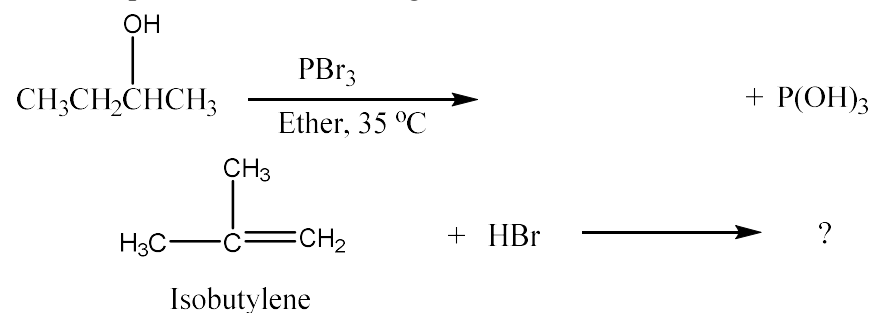


Draw the structure and find the degree the following alkyl halides:

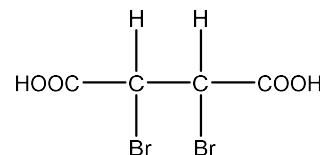
i) 2-Bromo-2-methylbutane

ii) 1-Chloro-2,2-dimethylpropane

Predict the product of the following reaction:



- What are nucleophilic substitution reactions? Describe the kinetics, mechanism and stereochemistry of S_N2 reaction. [5]
- Write difference between conformation and configuration. Would you expect the following compound to be optically active? Explain. [5]

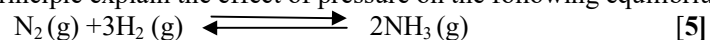


- What are carbocations? Discuss the structure, classification, and stability of carbocations. [5]

Physical Chemistry

Attempt all the question

- 5.a) What do you understand by the terms buffer capacity and buffer range? What are K_p and K_c ? How are they related? State le-Chatliers principle. On the basis of this principle explain the effect of pressure on the following equilibrium.



- b) State law of mass action. Derive a relationship between K_p and K_c . In which condition K_p becomes equal to K_c ? [5]

OR

- a) Calculate the P^H of 0.01M H_2SO_4 solution. Explain why methyl orange is not suitable indicator for weak acid strong base titrations. Define Tyandall effect. What type of colloids show such type of effect? [5]
- b) What do you understand by acid base indicator? Describes the theories of acid base indicators. [5]
- 6.a) What are lyophilic and lyophobic colloids? Mention some characteristics of lyophilic colloids. Define the term elevation boiling point of solution. [5]
- b) What do you understand by colloidal state and colloidal solution? Describe the different methods for the preparation of colloidal solutions. [5]

THE END