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TOPIC:- classification of solvent

Summary and Assignment

- **Summary**
- **Conclusion**
- **Tutor marked assignment**

➤ **Summary and conclusion**

Solvent are classified based on their behaviour. These include, polarity, ionization potential, content of hydrogen/proton, ability to coordinate with metal, acidic or basic properties and inertness. In spite of the various ways of classification, it can be concluded that some classification are more general than others for example, polar solvent refers to all solvents that are polar including protic and aprotic polar solvent.

➤ **Tutored marked assignment**

1. What is the unique property of amphiprotic solvents ? Use suitable examples and equations to support your answer.
2. Differentiate between acidic and basic solvents.
3. Differentiate between coordinating and non-coordinating solvents
4. Classify the following solvents into (a) Protic or non protic and (b) polar and non-polar liquid ammonia, anhydrous sulphuric acid, DMSO, nitrosyl tetroxide, phoryl oxide,

hydrogen fluoride, liquid sulphur (IV) oxide and oxyhalides.
Give reasons for your classification

Solved problem 1

- (a) What are the general characteristics of polar aprotic solvent
 - (b) What are the general characteristics of polar protic solvents
 - (c) Differentiate between ionizable and non ionizable solvents.
- Give at least two examples for each

Solution

- (a) Characteristics of polar aprotic solvents are,
 - i. They accept hydrogen bonds
 - ii. They do not have acidic hydrogen
 - iii. They dissolve salts
- (b) Characteristics of polar protic solvent are
 - i. Display of hydrogen bonding
 - ii. Possession of acidic hydrogen
 - iii. Ability to dissolve salts which may be cation by unshared free electron pair or anions by hydrogen bonding
- (c) Ionizable solvents: Solvents that can undergo self ionization (i.e auto ionization) are called ionisable solvents. Examples are NH_3 , HF , SO_2 , N_2O_4 , ClF_3 , BrF_3 and POCl_3 . On the other hand, non ionizable solvents are

solvents such as benzene, which do not ionize. Most hydrocarbon and carbon tetrachloride are other examples of non-ionizing solvent.