

Date :- 14/04/2020

Department - Chemistry

Name of the teacher - Dr. Anub Kanti Biri

Class \rightarrow UG III Sem

Paper \rightarrow CC 7 / Physical Chemistry

Topic \rightarrow Question Bank (Physical properties of molecules str II)

Mode of teaching \rightarrow Hand written form

classmate
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Q-1 :- What is polar and non-polar molecule?

Q-2 :- Atoms are non-polar, but a molecule may be either polar or non-polar - Explain

Q-3 :- Define dipole moment and mention its unit.

Q-4 :- What is bond moment?

Q-5 :- Define group moment?

Q-6 :- CO_2 molecule has Zero dipole moment, but H_2O molecule has fairly large dipole moment - Why?

Q-7 :- Para dinitro benzene is non-polar, but para dihydroxy benzene has a dipole moment - explain.

Q-8 :- The dipole moment of chlorobenzene is 1.7 D. Calculate the corresponding values for 1,2 and 1,3 - dichloro substituted benzenes. Compare these values with the experimental values of 2.35 D and 1.68 D respectively.

Q-9 :- The dipole moment of nitrobenzene is 4.23 D. A dinitro derivative of benzene has got the same dipole moment 4.23 D. Identify the isomers.

Q-10:- Calculate the dipole moment of O-H bond from the following information. The dipole moment of $\text{H}_2\text{O} = 1.68 \text{ D}$, $\cos \theta/2 = 0.64$, where θ is the H-O-H angle.

Q-11:- How does the dipole moment of a hetero nuclear diatomic molecule determine its percentage of ionic character?

Q-12:- What is polarisation?

Q-13:- ~~Derive~~ Derive Clausius-Mossotti equation

Q-14:- Deduce Debye equation.

Q-15:- Define molar refraction and hence deduce Lorentz-Lorentz equation.

Q-16:- What is plane polarised light? What is optical activity?

Q-17:- What is specific rotation? On factors does it depend?

Q-18:- Define Paramagnetism, Diamagnetism & ferromagnetism.

Q-19:- What is Temperature Independent Paramagnetism (TIP)?

Q-20:- Calculate the specific rotation of sucrose if a 20% solution of it when placed in a 2-decimeter polarimeter tube shows an angle of rotation of 26.4° .