Spectroscopy – II

Raman Spectroscopy

1. Raman spectroscopy deals with the _____ of light.

    a) Absorption
    b) Scattering
    c) Gain
    d) None of These

    Ans : **b)**

2. The scattered photon has same frequency (or energy) as the incident photon is _____ scattering.

    a) Raman
    b) Rayleigh
    c) Raoult
    d) Charles

    Ans. : **b)**

3. The scattered photon has different frequency (or energy) as the incident photon is _____ scattering.

    a) Raman
    b) Rayleigh
    c) Raoult
    d) Charles

    Ans. : **a)**

4. When the molecule, excited to the higher unstable vibrational state, returns to the original vibrational state is _____ scattering
    a) Raman
    b) Rayleigh
    c) Raoult
    d) Charles

    Ans. : **b)**

5. The Rayleigh line is for more intense than ____ lines & stoke lines have greater intensity than ____ lines.
    a) stokes, anti stokes
    b) anti stokes, stokes
    c) stokes, stokes

d) anti stokes, anti stokes

Ans : **a)**

6. The selection rule for pure rotational Raman spectrum of a diatomic molecule is

a) $\Delta J = 0, \pm 1$
b) $\Delta J = 0, \pm 2$
c) $\Delta J = 0, \pm 3$
d) None of These

Ans : **b)**

7. For centrosymmetric molecule, the vibration which is active in IR is inactive in Raman & the vibration which is inactive in IR is active in Raman spectra is called _____ principle.

a) Mutual exclusion
b) Pauli's exclusion
c) Raman
d) Rayleigh

Ans :**a)**

B.Electromagnetic Spectroscopy

8. Normally transition occur from the ground electronic state to excited electronic state in which spin of electron changes are called _____ transition.

a) Allowed
b) Forbidden
c) Excited
d) None of These

Ans : **b)**

9. Normally transition occur from the ground electronic state to excited electronic state in which spin of electron do not changes are called _____ transition.

a) Allowed
b) Forbidden
c) Excited
d) None of These

Ans : **a)**

10. Allowed transitions in electromagnetic spectroscopy is

    a) 6 → 6*, π → π*
    b) π → n*, n → 6*n → π *
    c) n→ π*, n → 6*
    d) All of the above

    Ans : **d)**

11. The energy required for this type of transition is very high therefore spectrum occurs in far UV region.

    a) 6→6*
    b) π → π*
    c) n→ π*
    d) n→ 6*

    Ans : **a)**

12. The energy required for this type of transition is lowest.

    a) 6→6*
    b) π → π*
    c) n→ π*
    d) n→ 6*

    Ans : **c)**

13. An electronic transition takes place so rapidly that a vibrating molecule does not change its internuclear distance appreciably during the transition. All transitions occur vertically since the value of frequency (*v*) does not change is the basis of _____ principle.

    a) Frank Condon
    b) Raman
    c) Mutual exclusion
    d) Pauli's exclusion

    Ans : **a)**