

CHEMISTRY

1. (3)

When $c = v \times \lambda$ then

$$\lambda = \frac{c}{v} = \frac{3 \times 10^8}{2 \times 10^6} = 1.5 \times 10^2 \text{ m}$$

2. (1)

For $n_4 \rightarrow n_1$, greater transition, greater the energy difference, lesser will be the wavelength.

3. (1)

$$\lambda = \frac{h}{mv} = \frac{6.63 \times 10^{-34}}{10^{-3} \times 100} = 6.63 \times 10^{-33} \text{ m}$$

4. (3)

According to $\Delta x \times \Delta p = \frac{h}{4\pi}$

$$\Delta x = \frac{h}{\Delta p \times 4\pi} = \frac{6.62 \times 10^{-34}}{1 \times 10^{-5} \times 4 \times 3.14}$$

$$= 5.27 \times 10^{-30} \text{ m.}$$

5. (4)

It is the ground state configuration of chromium.

6. (1)

Number of radial nodes = $(n - l - 1)$ For 3s: $n = 3, l = 0$

(Number of radial node = 2)

For 2p: $n = 2, l = 1$

(Number of radial node = 0)

7. (2)

In Balmer series of hydrogen atomic spectrum which electronic transition causes third line

 $O \rightarrow L, n_2 = 5 \rightarrow n_1 = 2$

8. (4)

$$\begin{aligned} \bar{\nu} &= R \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right] = 109677 \left[\frac{1}{2^2} - \frac{1}{6^2} \right] \\ &= 109677 \times \frac{2}{9} = 24372 \text{ cm}^{-1} \end{aligned}$$

9. (4)

Extent of adsorption increase with increase in critical temperature

10. (3)

Extent of adsorption and intermolecular force \propto van der Waal constant.

(1) $\text{NH}_3 > \text{CO}_2 > \text{CH}_4$