Chemistry [DPP]

Atomic Structure

DPP-10

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1. No. of wave in fourth orbit :–

(A) 4 (B) 5

(C) 0 (D) 1

2. (n +1) is the principal quantum number of the energy state for an atom. What are the number of elliptical orbits associated with it :–

(A) (n – 1) (B) (n + 1)

(C) (n – 2) (D) n

3. The uncertainity in position of an electron & helium atom are same. If the uncertainity in momentum for the electron is 32×10^5 , then the uncertainity in momentum of helium atom will be

(A) 32×10^5 (B) 16×10^5

(C) 8×10^5 (D) None

4. What is the ratio of the De-Broglie wave lengths for electrons accelerated through 200 volts and 50 volts :-

(A) 1 : 2 (B) 2 : 1
(C) 3 : 10 (D) 10 : 3

5. The uncertainty in the position of an electron (mass 9.1×10^{-28}gm) moving with a velocity of 3×10^{4} cm sec^{-1}, uncertainity in velocity is 0.011% will be:-

(A) 1.92 cm (B) 7.68 cm
(C) 0.175 cm (D) 3.84 cm

6. A particle X moving with a certain velocity has a debroglie wavelength of 1Å. If particle Y has a mass of 25% that of X and velocity 75% that of X, debroglies wavelength of Y will be :-

(A) 3Å (B) 5.33 Å
(C) 6.88 Å (D) 48Å

7. Heisenberg Uncertainity principle is not valid for

(A) Moving electron

(B) Motor car

(C) Stationary particles

(D) 2 & 3 both

8. If uncertainty in position and momentum are equal, then uncertainty in velocity is ?

(A) $\sqrt{\frac{h}{\pi}}$ (B) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$

(C) $\sqrt{\frac{h}{2\pi}}$ (D) $\frac{1}{m}\sqrt{\frac{h}{\pi}}$

9. The measurement of the electron position is associated with an uncertainty in momentum, which is equal to 1×10^{-18} g cm s^{-1} . the uncertainty in electron velocity is : (mass of electron = 9×10^{-28}g)

(A) 1×10^{11} cm s^{-1}

(B) 1×10^{9} cm s^{-1}

(C) 1×10^{6} cm s^{-1}

(D) 1×10^{5} cm s^{-1}

10. Which of the following represent Heisenberg's uncertainity principle :-

(A) $\Delta x \times \Delta v \geq \frac{h}{4\pi m}$

(B) $\Delta x \times \Delta P \geq \frac{h}{4\pi m}$

(C) $\Delta x \times \Delta v \leq \frac{h}{4\pi m}$

(D) $\Delta x \times \Delta P \leq \frac{h}{4\pi m}$

11. If the de-Broglie wavelength of the fourth Bohr orbit of hydrogen atom is 4Å, the circumference of the orbit will be :-

(A) 4Å (B) 4 nm

(C) 16 Å (D) 16 nm

12. The mass of a particle is 10^{-10} g and its diametre is 10^{-4} cm. If its velocity is 10^{-8} cm sec^{-1} with 0.0001% uncertainty in measurement. The uncertainty in its position is :

(A) 5.2×10^{-8} m

(B) 5.2×10^{-7} m

(C) 5.2×10^{-6} m

(D) 5.2×10^{-9} m

13. The mass of an electron is m, charge is e and it is accelerated from rest through a potential difference of V volts. The velocity acquired by electron will be :

(A) $\sqrt{\frac{V}{m}}$ (B) $\sqrt{\frac{eV}{m}}$

(C) $\sqrt{\frac{2eV}{m}}$ (D) Zero

14. If uncertainties in position and momentum are equal. The uncertainty of velocity is given by :

(A) $\sqrt{\frac{h}{\pi}}$ (B) $\sqrt{\frac{h}{2\pi}}$

(C) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$ (D) zero

15. For an electron in a hydrogen atom, the wave function is given by $\psi_{1s} = \frac{\pi}{\sqrt{2}}.e^{-r/a_0}$, where a_0 is the radius of first–Bohr's orbit and r is the distance from the nucleus with which probability of finding electron varies. What will be the ratio of probabilities of finding electrons at the nucleus to first Bohr's orbit a_0?

(A) zero (B) e

(C) e^2 (D) $1/e^2$

ANSWER KEY

1.	A	**2.**	D	**3.**	A
4.	A	**5.**	C	**6.**	B
7.	D	**8.**	B	**9.**	B
10.	A	**11.**	C	**12.**	A
13.	C	**14.**	C	**15.**	A