DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 6

Topic :- STRUCTURE OF ATOM

1 **(a)**

$E = 3 \times 10^{-12}$ergs

$\lambda = ?$

$h = 6.62 \times 10^{-27}$ergs

$c = 3 \times 10^{10}$cms^{-1}

$$E = \frac{hc}{\lambda}$$

$$3 \times 10^{-2} = \frac{6.62 \times 10^{-27} \times 3 \times 10^{10}}{\lambda}$$

$$\lambda = \frac{6.62 \times 10^{-27} \times 3 \times 10^{10}}{3 \times 10^{-12}}$$

$= 6.62 \times 10^{-5}$cm

$= 662 \times 10^{-7}$cm

$= 662 \times 10^{-9}$m

$= 662$ nm.

3 **(a)**

1. $1s$
2. $2s$
3. $2p$
4. $3d$
5. $3d$

In the absence of any field, $3d$ in (D) and (E) will be of equal energy.

3 **(c)**

Zeeman effect is splitting up of the lines of an emission spectrum in a magnetic field.

4 **(d)**

Bohr radius for nth orbit $= 0.53 \times \frac{n^2}{Z}$

Where, $Z =$ atomic number

$\therefore$ Bohr radius of 2nd orbit of $Be^{3+} = \frac{0.53 \times (2)^3}{4}$

$= 0.53$ Å

(d) Bohr radius of 1st orbit of $H = \frac{0.53 \times (1)^2}{1}$

Hence, Bohr's radius of 2nd orbit of $Be^{3+}$is equal to that of first orbit of hydrogen.

5 **(c)**

$\lambda = \frac{h}{mv}$

$\therefore mv = \frac{6.626 \times 10^{-34}}{5200 \times 10^{-10}} = 1.274 \times 10^{-27}$

For electron, $m = 9.1 \times 10^{-31}$kg

$9.1 \times 10^{-31} \times v = 1.274 \times 10^{-27}$

$v = 1400$ m/s

6 **(b)**

$(n + l)$ is more for a subshell, more will be its energy.

7 **(c)**

[Ar]$3d^{10}$,$4s^1$ (atomic no. 29) electronic configuration belongs to copper.

8 **(a)**

Li^+ has charge of 1 proton due to loss of electron.

9 **(c)**

Mass or proton $= 1.672614 \times 10^{27}$kg

Mass of electron $= 1.60211 \times 10^{-31}$kg

$\therefore$ Mass of proton/Mass of electron $= \frac{1}{1837}$

10 **(c)**

Follow :$E_n = E_1/n^2$

12 **(a)**

Orbital angular momentum $= \sqrt{l(l+1)} \times \frac{h}{2\pi}$

For p-electron $(l = 1) = \sqrt{1(1+1)} \times \frac{h}{2\pi}$

$= \sqrt{2} \times \frac{h}{2\pi} = \frac{h}{\sqrt{2}\pi}$

13 **(a)**

Transition from any higher level to $n = 1$ gives Lyman series.

14 **(a)**

Total energy $= \frac{-e^2}{2r_n} = -3.4$ eV $= \frac{E_1}{n^2}$

$\therefore n^2 = \frac{-13.6}{-3.4} = 4 \ \therefore n = 2$

The velocity in II orbit

$= \frac{u_1}{2} = \frac{2.18 \times 10^8}{2}$ cm sec^{-1}

$$\therefore \lambda = \frac{h}{mu} = \frac{6.6 \times 10^{-27} \times 2}{9.108 \times 10^{-28} \times 2.18 \times 10^{8}} = 6.6 \times 10^{-10}$$

15 **(c)**

The orbital d_{z^2} has 2 lobes.

16 **(c)**

Nucleus of an atom is small in size but carries the entire mass *i.e.*, contains all the neutrons and protons.

17 **(a)**

In C_2H_2 total electrons $= 6 + 6 + 1 + 1 = 14$.

18 **(a)**

Cu^+ has $3d^{10}$ configuration.

19 **(a)**

Only 2 electrons in p-orbitals can have $m = 0$.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	A	A	C	D	C	B	C	A	C	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	A	A	A	C	C	A	A	A	C