

Chemistry



Chapter One

1-Write the scientific term:-

- 1- The amount of energy absorbed or emitted when an electron is transferred from an energy level to another. **(Quantum)**
- 2- Electrons occupy the sublevels in the Order of increasing their energy, the lowest is filled first **(Auf bau principle)**
- 3-The electron is a (-ve) particle with waves properties.
(Dual nature of the electron)
- 4- No electron pairing takes place in a given sublevel until each orbital contains one electron. **(Hund's rule)**
- 5- The number that defines the orbitals of a given energy sublevel.
(Magnetic Quantum no.)
- 6- The determination of both velocity and the position of an electron at the same time is practically impossible **(un certainty principle)**
- 7- A limited number of colored lines that is characterized for each element. **(Spectral lines)**
- 8- The electron which gains energy and transfers to higher energy level.
(Excited electrons)
- 9- The region of the space around the nucleus which has a great probability of finding the electrons. **(Orbital)**
- 10- A pure simple substance that can't be changed into simpler from by traditional chemical method. **(Element)**
- 11- The no. that defines the spin motion of electron around its axis
(Spin quantum number)

Chemistry



12- The no. that defines the sublevels in a given principal energy level

(Subsidiary quantum number)

2- Write the name of the scientist (s) or 1st one who:-

1- Stated that all matters composed of four components water, air, dust and fire with different ratios. **(Aristotle)**

2- Named the smallest part of matter: the atom

(Greek philosophies)

3- Discovered the cathode rays **(Thomson)**

4- Rejected the concept of the atom **(Aristotle)**

5- Discovered the nucleus of the atom **(Rutherford)**

6- Described the atom as a sphere of a uniform positive electricity

(Thomson)

7- Explained the hydrogen atom spectra **(Bohr)**

10 – Defined the element as a pure simple substance **(Boyle)**

11- Solve the wave equation **(Schrodinger)**

3- Give reason: -

1- Zinc sulphide is used Rutherford's experiment

To glow at the site of collision with α - particles.

2- The sublevel (p) is saturated by 6 electrons .

Bec. It consists of 3 orbital's ($2 \times 3 = 6 \text{ } e^-$)

3- It is not correct to consider the electron as a negative particle only

Bec: it has wave properties.

Chemistry



4- The electrons prefer to be paired than to be single in the higher energy level.

Bec. : This gives the atom more stability.

5- The matter waves are different from the moving body and their speed \neq that of electromagnetic waves.

Bec. : They are not separated from the moving body and their speed \neq that of the electromagnetic waves.

6- The electron has a dual nature.

Bec. : The electron is a material particle which has wave properties.

4- Write: the probability of four quantum numbers of the last electron for the following:

1) ${}_5\text{B}$ $1\text{S}^2, 2\text{S}^2, 2\text{P}^1$

n	L	m_l	m_s
2	1	-1	$+\frac{1}{2}$

2) ${}_9\text{F}$ $1\text{S}^2, 2\text{S}^2, {}^2\text{P}^5$

n	L	m_l	m_s
2	1	+1	$+\frac{1}{2}$

3) ${}_{11}\text{Na}$ $1\text{S}^2, 2\text{S}^2, {}^2\text{P}^6, 3\text{S}^1$

n	L	m_l	m_s
3	0	0	$+\frac{1}{2}$

Chemistry



5- Choose the Correct answer:-

1- The no. of energy sublevels in the principal energy level (n) equals

- a- n^2 b- $2n^2$ c- n d- $(2n)^2$

2- The no. of orbitals in a given sublevel (n) equals

- a- n^2 b- $2n^2$ c- n d- $(2n)^2$

3- The sublevels of an energy level are

- a- Equal in energy b- nearly equal in energy
c- different in energy d- different in energy and shape