

Which one is true about isotopes?

- A) Same number of neutrons
- B) Same mass number
- C) Same physical properties
- D) Same chemical properties

The number of moles present in 0.6 grams of silicon (Atomic mass: Si = 28, O = 16) is:

- A) 0.01 mole
- B) 0.044 mole
- C) 0.064 mole
- D) 0.054 mole

Volume occupied by 4.4g of CO_2 at STP is:

- A) 2.24 dm^3
- B) 22.4 dm^3
- C) 2.2 cm^3
- D) 1.12 dm^3



The number of H^+ ions when 0.1 moles of sulfuric acid is completely ionized in water:

- A) $4 \times 6.022 \times 10^{23}$
- B) $2 \times 6.022 \times 10^{23}$
- C) $1 \times 6.022 \times 10^{23}$
- D) $2 \times 6.022 \times 10^{22}$

When 0.5 moles of $\text{Al}_2(\text{SO}_4)_3$ are dissolved in water, the total number of particles produced is:

- A) 12×10^{23}
- B) 1.5×10^{24}
- C) 30×10^{23}
- D) 2.5×10^{23}

The mass of one molecule of O_2 is:

- A) $6.02 \times 10^{23} \text{ g} / 32$
- B) $32 / 6.02 \times 10^{23} \text{ g}$
- C) 0.32 g
- D) 32 g

The amount of oxygen in grams which contains 1.5×10^{22} molecules:

- A) 0.08 g
- B) 8.0 g
- C) 0.80 g
- D) 128.0 g

The number of electrons in half a mole of Na^+ ions is

- A) $10 N_A$
- B) $5 N_A$
- C) $5.5 N_A$
- D) 5



3×10^{-21} moles of an amino acid having a molecular mass of 200 g/mol would have:

- A) 200 molecules
- B) 300 molecules
- C) 1800 molecules
- D) 36,000 molecules

The relative atomic mass of oxygen is 16 amu. What is the mass of 2 moles of oxygen?

- A) 32 g
- B) 16 g
- C) 64 g
- D) 8 g

Which of the following has the maximum mass?

- A) 25g of iodine
- B) 25g mole of water
- C) 25g atom of oxygen
- D) 25g of nitrogen gas



The mass of a proton is:

- A) $9.1095 \times 10^{-31} \text{ kg}$
- B) $1.602 \times 10^{-27} \text{ kg}$
- C) $1.6726 \times 10^{-27} \text{ kg}$
- D) $1.6750 \times 10^{-27} \text{ kg}$

What will be the effect on a proton when passed through an electric field?

- A) Deflection towards the anode
- B) Deflection perpendicular to the electric field
- C) Deflection towards the cathode
- D) Deflection downwards in the electric field

Positive rays are produced:

- A) By burning of gas
- B) By cooling of gas
- C) By the bombardment of cathode rays on gas molecules
- D) From the anode like cathode rays are produced from the cathode



The pressure in a gas discharge tube is kept at:

- A) 10 torr
- B) 1 torr
- C) 0.1 torr
- D) 0.01 torr

Positive rays give a flash on:

- A) AgNO_3 plate
- B) AgCl plate
- C) ZnO
- D) ZnS

The relationship between the energy of a photon of light and its frequency is given by:

- A) de Broglie's dual nature of matter
- B) Planck's Quantum Theory
- C) Bohr's model
- D) Rutherford's atomic model

The velocity of a photon:

- A) Is independent of wavelength
- B) Depends upon its source



- B) Depends upon its source
- C) Depends upon its frequency
- D) Equals the square of its amplitude

Planck's equation is:

- A) $E = mc^2$
- B) $E = mv^2/2$
- C) $E = h\nu$
- D) $E = nh/2\pi$

Planck's theory states that energy is emitted:

- A) In a continuous manner
- B) In a discontinuous manner
- C) Simultaneously
- D) In the form of heat

Quantum number which is not derived from Schrodinger wave equation:

- A) Principal
- B) Azimuthal
- C) Magnetic
- D) Spin



The number of degenerate orbitals in a sub-shell having sausage shape are

- A) 1
- B) 3
- C) 5
- D) 7

Quantum number values for the 3p orbital are:

- A) $n=3, l=0$
- B) $n=3, l=1$
- C) $n=2, l=1$
- D) $n=2, l=0$

The maximum number of electrons that can be accommodated in a p-subshell is:

- A) 2
- B) 6



- B) **6**
- C) 10
- D) 14

Which sub-shell has the highest energy?

- A) **$n=5, l=3, m=+1$**
- B) $n=5, l=2, m=+2$
- C) $n=4, l=3, m=0$
- D) $n=4, l=0, m=+1$

Magnetic quantum number values for the d-subshell are

- A) 2
- B) 3
- C) **5**
- D) 7

A p-orbital has _____ energy than an s-orbital of the same principal quantum number.

- A) **Lower**



Which set of quantum numbers represents the 19th electron of a Cu atom?

- A) $n=4, l=0, m=0, s=+1/2$
- B) $n=3, l=2, m=0, s=+1/2$
- C) $n=4, l=1, m=0, s=+1/2$
- D) $n=3, l=0, m=0, s=+1/2$

The d-orbital which is bi-lobed with a collar is represented as:

- A) d_{xy}
- B) d_{yz}
- C) d_{z^2}
- D) $d_{x^2-y^2}$

Which of the following species is/are isoelectronic with K^+ ?

- A) P^{-3}
- B) S^{-2}
- C) All of these
- D) Si^{+4}

