

**1. What is the atomic number of Carbon?**

- A) 6
- B) 12
- C) 14
- D) 8

**Answer:**

A) 6

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**2. How many moles are in 10 grams of water (H<sub>2</sub>O)?**

(Molar mass of H<sub>2</sub>O = 18 g/mol)

- A) 0.25 mol
- B) 1.0 mol
- C) 0.55 mol
- D) 0.10 mol

**Answer:**

Moles = mass / molar mass = 10 g / 18 g/mol = **0.556 mol**  $\approx$  **0.55 mol**

**Answer:**

C) 0.55 mol

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**3. What is the general formula for an alkane?**

- A) C<sub>n</sub>H<sub>2n-2</sub>
- B) C<sub>n</sub>H<sub>2n+2</sub>
- C) C<sub>n</sub>H<sub>n</sub>
- D) C<sub>n</sub>H<sub>n</sub>O<sub>n</sub>

**Answer:**

B) C<sub>n</sub>H<sub>2n+2</sub>

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**4. Which of the following gases is most likely to exhibit the highest rate of diffusion at room temperature?**

- A) Oxygen (O<sub>2</sub>)
- B) Nitrogen (N<sub>2</sub>)

C) Helium (He)  
D) Carbon dioxide (CO<sub>2</sub>)

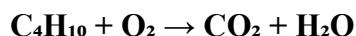
**Answer:**

C) Helium (He)

(The rate of diffusion is inversely proportional to the square root of the molar mass, and He has the lowest molar mass.)

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**5. Balance the following chemical equation:**



A) C<sub>4</sub>H<sub>10</sub> + 13 O<sub>2</sub> → 8 CO<sub>2</sub> + 10 H<sub>2</sub>O  
B) C<sub>4</sub>H<sub>10</sub> + 5 O<sub>2</sub> → 4 CO<sub>2</sub> + 6 H<sub>2</sub>O  
C) C<sub>4</sub>H<sub>10</sub> + 7 O<sub>2</sub> → 4 CO<sub>2</sub> + 6 H<sub>2</sub>O  
D) C<sub>4</sub>H<sub>10</sub> + 3 O<sub>2</sub> → 2 CO<sub>2</sub> + 4 H<sub>2</sub>O

**Answer:**

A) C<sub>4</sub>H<sub>10</sub> + 13 O<sub>2</sub> → 8 CO<sub>2</sub> + 10 H<sub>2</sub>O

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**6. What is the pH of a solution with a hydrogen ion concentration of  $1.0 \times 10^{-7}$  mol/L?**

A) 7  
B) 0  
C) 1  
D) 14

**Answer:**

$$\text{pH} = -\log[\text{H}^+]$$
$$\text{pH} = -\log(1.0 \times 10^{-7}) = 7$$

**Answer:**

A) 7

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**7. What volume of 0.5 M NaOH is required to neutralize 25 mL of 1 M HCl?**

(Use the equation: M<sub>1</sub>V<sub>1</sub> = M<sub>2</sub>V<sub>2</sub>)

- A) 12.5 mL
- B) 25 mL
- C) 50 mL
- D) 10 mL

**Answer:**

$$\begin{aligned}M_1 V_1 &= M_2 V_2 \\(1 \text{ M})(25 \text{ mL}) &= (0.5 \text{ M})(V_2) \\V_2 &= (1 \times 25) / 0.5 = \mathbf{50 \text{ mL}}\end{aligned}$$

**Answer:**

- C) 50 mL

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**8. What is the main product of the reaction between an acid and a base?**

- A) Salt
- B) Water
- C) Oxygen
- D) Hydrogen gas

**Answer:**

- A) Salt

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**9. Calculate the molar mass of calcium carbonate ( $\text{CaCO}_3$ ).**

(Molar masses: Ca = 40, C = 12, O = 16)

- A) 100 g/mol
- B) 94 g/mol
- C) 98 g/mol
- D) 102 g/mol

**Answer:**

Molar mass = 40 (Ca) + 12 (C) + (3 × 16) (O) = 40 + 12 + 48 = **100 g/mol**

**Answer:**

- A) 100 g/mol

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**10. What type of bond is formed between sodium (Na) and chlorine (Cl) in sodium chloride (NaCl)?**

- A)** Covalent bond
- B)** Ionic bond
- C)** Metallic bond
- D)** Hydrogen bond

**Answer:**

- B)** Ionic bond

Here is a comprehensive O'Level Chemistry quiz with 60 questions and answers, including calculations. These questions cover a wide range of topics from atomic structure, periodic table trends, chemical bonding, stoichiometry, acid-base reactions, and more.

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## O'Level Chemistry Quiz

### 1. What is the atomic number of carbon?

**Answer:**

6

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### 2. How many protons are in an atom of sodium (Na)?

**Answer:**

11 protons

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### 3. Calculate the relative atomic mass of chlorine given that the relative abundances of its isotopes are:

- $^{35}Cl = 75\%$
- $^{37}Cl = 25\%$

**Answer:**

Relative atomic mass =  $(0.75 \times 35) + (0.25 \times 37) = 35.5$

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### 4. What is the molecular formula of methane?

**Answer:**



### 5. Name the type of bond formed between sodium and chlorine in sodium chloride (NaCl).

**Answer:**

Ionic bond

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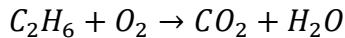
**6. What is the valency of oxygen?**

**Answer:**

2

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**7. Balance the following chemical equation:**



**Answer:**



**8. Calculate the number of moles in 24 grams of carbon dioxide (CO<sub>2</sub>).**

**Answer:**

Molar mass of CO<sub>2</sub> = 12 + 2(16) = 44 g/mol

$$\text{Moles} = \frac{24}{44} = 0.545 \text{ mol}$$

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**9. What is the oxidation state of chlorine in NaCl?**

**Answer:**

-1

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**10. What is the empirical formula of hydrogen peroxide, H<sub>2</sub>O<sub>2</sub>?**

**Answer:**



**11. How many atoms are in 1 mole of a substance?**

**Answer:**

$6.022 \times 10^{23}$  atoms (Avogadro's number)

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**12. What is the percentage composition of oxygen in water (H<sub>2</sub>O)?**

**Answer:**

Molar mass of  $\text{H}_2\text{O} = 2(1) + 16 = 18 \text{ g/mol}$

Percentage of oxygen =  $\frac{16}{18} \times 100 = 88.89\%$

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**13. Name the gas produced when a metal reacts with an acid.**

**Answer:**

Hydrogen gas

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**14. What is the pH of a neutral solution?**

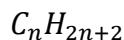
**Answer:**

7

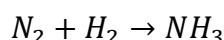
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**15. What is the general formula of an alkane?**

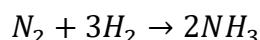
**Answer:**



**16. Balance the equation:**



**Answer:**



**17. Calculate the number of molecules in 2 moles of oxygen gas ( $\text{O}_2$ ).**

**Answer:**

Number of molecules =  $2 \times 6.022 \times 10^{23} = 1.2044 \times 10^{24}$

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**18. What is the molar mass of sulfuric acid ( $\text{H}_2\text{SO}_4$ )?**

**Answer:**

Molar mass of  $\text{H}_2\text{SO}_4 = 2(1) + 32 + 4(16) = 98 \text{ g/mol}$

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**19. What is the name of the process where a liquid changes into a gas at its boiling point?**

**Answer:**

Boiling

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**20. What is the formula of calcium carbonate?**

**Answer:**



**21. How many grams are in 3 moles of sodium chloride (NaCl)?**

**Answer:**

Molar mass of  $\text{NaCl} = 23 + 35.5 = 58.5 \text{ g/mol}$

Mass =  $3 \times 58.5 = 175.5 \text{ g}$

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**22. Which gas is produced when an acid reacts with a carbonate?**

**Answer:**

Carbon dioxide ( $\text{CO}_2$ )

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**23. What is the molecular formula of ethene?**

**Answer:**



**24. Define isotopes.**

**Answer:**

Isotopes are atoms of the same element that have the same number of protons but a different number of neutrons.

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**25. Calculate the volume of 1 mole of an ideal gas at standard temperature and pressure (STP).**

**Answer:**

22.4 L

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**26. What is the name of the process where a solid changes directly to a gas?**

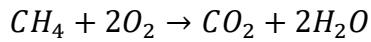
**Answer:**

Sublimation

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**27. What is the chemical equation for the combustion of methane?**

**Answer:**



**28. What is the common name of sodium bicarbonate?**

**Answer:**

Baking soda

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**29. What is the oxidation state of hydrogen in HCl?**

**Answer:**

+1

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**30. What is the name of the process by which a solid dissolves in a solvent?**

**Answer:**

Dissolution

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**31. How many grams of NaOH are required to make 0.5 moles of NaOH solution?**

**Answer:**

Molar mass of NaOH =  $23 + 16 + 1 = 40$  g/mol

Mass =  $0.5 \times 40 = 20$  g

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**32. What is the formula for calculating molarity?**

**Answer:**

Molarity  $M = \frac{\text{moles of solute}}{\text{volume of solution in liters}}$

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**33. Name the two main types of chemical bonds.**

**Answer:**

Ionic and covalent bonds

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**34. What is the color of copper (II) sulfate in its hydrated form?**

**Answer:**

Blue

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**35. What is the formula for the compound formed between calcium and chlorine?**

**Answer:**

$CaCl_2$

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**36. Calculate the amount of heat required to raise the temperature of 50 g of water from 20°C to 80°C, given that the specific heat capacity of water is 4.18 J/g°C.**

**Answer:**

Heat required  $Q = mc\Delta T = 50 \times 4.18 \times (80 - 20) = 12540$  J

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**37. What is the formula of sulfur dioxide?**

**Answer:**

$SO_2$

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**38. How do you calculate the molar volume of a gas?**

**Answer:**

$$\text{Molar volume} = \frac{\text{volume of gas}}{\text{moles of gas}}$$

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**39. Define exothermic reaction.**

**Answer:**

An exothermic reaction releases heat energy.

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**40. What is the name of the process in which a gas dissolves in a liquid?**

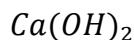
**Answer:**

Solubility

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**41. What is the formula of calcium hydroxide?**

**Answer:**



**42. What is the pH of a solution with a concentration of  $10^{-7}$  mol/L of hydrogen ions?**

**Answer:**

$$\text{pH} = 7$$

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**43. What is the empirical formula of glucose  $\text{C}_6\text{H}_{12}\text{O}_6$ ?**

**Answer:**



**44. What is the product of the reaction between sodium and water?**

**Answer:**

Sodium hydroxide (NaOH) and hydrogen gas (H<sub>2</sub>)

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**45. What is the color change when an acid is titrated with phenolphthalein?**

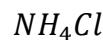
**Answer:**

Colorless to pink

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**46. What is the formula of ammonium chloride?**

**Answer:**



**47. What is the molarity of a solution that contains 2 moles of solute in 1 liter of solution?**

**Answer:**

2 M

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**48. What is the formula for the concentration of a solution?**

**Answer:**

$$\text{Concentration} = \frac{\text{moles of solute}}{\text{volume of solution in liters}}$$

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**49. Name the process by which a gas is converted to a liquid.**

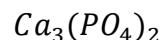
**Answer:**

Condensation

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**50. What is the formula for calcium phosphate?**

**Answer:**



**51. What is the molar mass of potassium nitrate (KNO<sub>3</sub>)?**

**Answer:**

$$39 + 14 + 3(16) = 101 \text{ g/mol}$$

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**52. What is the oxidation state of oxygen in H<sub>2</sub>O<sub>2</sub>?**

**Answer:**

-1

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**53. Calculate the number of moles in 36 grams of water.**

**Answer:**

Molar mass of H<sub>2</sub>O = 18 g/mol

$$\text{Moles} = \frac{36}{18} = 2 \text{ mol}$$

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**54. What is the formula of aluminum oxide?**

**Answer:**



**55. What is the pH of a strong acid solution?**

**Answer:**

Less than 7

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**56. What type of reaction is 2H<sub>2</sub> + O<sub>2</sub> → 2H<sub>2</sub>O?**

**Answer:**

Synthesis reaction

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**57. What is the unit for measuring concentration in chemistry?**

**Answer:**

Molarity (M)

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**58. What is the process of removing impurities from a liquid by distillation?**

**Answer:**

Fractional distillation

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**59. How many molecules are in 3 moles of methane?**

**Answer:**

$$3 \times 6.022 \times 10^{23} = 1.8066 \times 10^{24}$$

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**60. What is the reaction between a metal and oxygen called?**

**Answer:**

Oxidation or combustion