# CHEMISTRY SECTION

1. Elements are presented in vertical columns (groups) and horizontal rows (periods).

Q- Name a chemical found in the third group and the third period.

A- Aluminium.

2. Isotopes are elements with different number of neutrons.

Q- How many neutrons does carbon 12 have?

A- 6.

Q- How many neutrons does carbon 14 have?

A- 8.

3. Ions are atoms that have gained or lost electrons.

Q- Which of the following chemical formulae are ionic compounds?

Na2CO3  KCl NH3 Mg(OH)2 N2P5 CO2

A- Na2CO3  KCl Mg(OH)2

Q- Complete the following table. (Change font colour to black for the answers).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ions/atoms | Atomic number | Mass number | Number of electrons | Number of neutrons |
| Ca | 20 | 40 | 20 | 20 |
| K+ | 19 |  | 18 | 20 |
| S2- | 16 | 32 | 18 | 16 |
| Cu | 29 | 63 | 29 | 34 |

4. Dot diagrams show the number of valence electrons involved in bonding.

Q- Draw the dot diagram showing ionic bonds in the compound CaCl2.

 Cl Ca Cl

 +2  \_

A- Ca + 2 Cl

Remove this block to reveal the answer.

Q- Use the dot diagram to show covalent bonding in the molecule CO2.

 O C O

A- O C O

Remove this square to reveal the answer

5. Metals usually take the positive valence sign when they become ions.

Q- Underline those that are classified as metal ions.

Na+ Mg2+ F- S2- NH4+ H+ Al3+ OH- CO32-

A- Na+ Mg2+ Al3+

6. Metals react with acid to produce hydrogen gas and salt.

Q- Complete the following chemical reaction.

Al + H2SO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ + H2

A- 2Al + 3H2SO4 Al2(SO4)3 + 3H2

Q- Complete the following chemical reaction.

Zn + \_\_\_\_\_\_\_\_\_ Zn3(PO4)2 + H2

A- Zn + H3PO4 Zn3(PO4)2 + H2

Q- Balance the following chemical reaction.

Al + H2SO4 Al2(SO4)3 + H2

A- 2Al + 3H2SO4 Al2(SO4)3 + 3H2

Q- Balance the following chemical reaction.

Cu(II) + H3PO4 CuPO4 + H2

A- 3Cu + 2H3PO4 Cu3(PO4)2 + 3H2

7. Metal oxides and hydroxides react with acid to produce salt and water.

Q- Complete the following chemical reactions.

CuO + HNO3 \_\_\_\_\_\_\_\_\_\_\_\_ + H2O

A- CuO + 2HNO3 Cu(NO3)2 + H2O

Q- Complete the following chemical reactions.

PbO + HCl \_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_

A- PbO + 2HCl PbCl2 + H2O

Q- Balance the following chemical reaction.

CuO + HNO3 Cu(NO3)2 + H2O

A- CuO + 2HNO3 Cu(NO3)2 + H2O

Q- Balance the following chemical reaction.

Al(OH)3 + H2SO4 Al2(SO4)3 + H2O

A- 2Al(OH)3 + 3H2SO4 Al2(SO4)3 + 6H2O

8. When solutions are mixed together, sometimes a precipitate form. The ions responsible for the formation of the precipitate are written in an ionic equation.

Q- Write an ionic equation for these two solutions, if no precipitate forms, write NR.

Pb(NO3)2 + K2SO4

A- Pb2+ + SO42- PbSO4

 (aq) (aq) (S)

Q- Write an ionic equation for these two solutions, if no precipitate forms, write NR.

 CaBr2 + K2S

A- Ca2+ + S2- CaS

 (aq) (aq) (S)

Q- Write an ionic equation for these two solutions, if no precipitate forms, write NR.

Na2CO3 + CuSO4

A- NR

9. Write the name and formula of the salt formed.

|  |  |  |
| --- | --- | --- |
| **Reactants**  | **Name of salt** | **Formula of salt** |
| Copper(II) and nitric acid | Copper nitrate | Cu(NO3)2 |
| Lead oxide & hydrochloric acid | Lead chloride | PbCl2 |
| Calcium carbonate & acetic acid | Calcium acetate | Ca(CH3COO)2 |