**Year 9 Atomic Structure and Chemical Reactions Test Revision**

1. State whether the compounds below are ionic or covalent
2. Calcium oxide (CaO) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Copper chloride (CuCℓ2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Methane (CH4) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Potassium iodide (KI) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Ammonium (NH3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Sulfur dioxide (SO2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Write the names of these compounds.
   1. Fe2O3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. ZnCO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. N2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. SO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. KNO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Na2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. What are the three subatomic particles that make up an atom? What is the electrical charge on each particle?
10. What does the atomic number of an element say about the subatomic particles in its atoms?
11. What is the relationship between the number of protons and electrons in a neutral atom?
12. Explain the difference between a neutral and a charged atom.
13. Which subatomic particles are included in the atomic weight? Why is the other particle not included?
14. What relative scale is used to measure the mass of subatomic particles? Why is it used?
15. Draw a labelled diagram of an atom with an atomic number of 9 and a mass of 19.
16. Write an atomic symbol for the atom you drew in question 7.
17. What is an isotope? Use an example as part of your answer.
18. Draw electron configuration diagrams and write the shorthand configuration of the following elements.
    1. Lithium
    2. Magnesium
    3. Chlorine
    4. Oxygen
    5. Carbon
    6. Nitrogen
19. How is a flame test conducted?
20. What does a flame test show, and how is that useful to scientists?
21. Explain what is happening to the electrons during a flame test.
22. For each of the following reactions, write a **word equation** to describe the reaction.
    1. Iron metal reacts with oxygen to form iron oxide, or rust.
    2. Sodium hydroxide is mixed with nitric acid to form water and sodium nitrate.
    3. Lead oxide is formed when lead reacts with oxygen.
    4. Sulphuric acid is poured over magnesium metal to produce hydrogen gas and magnesium sulphate.
    5. Sodium and water react together to form sodium hydroxide and hydrogen gas.
23. Balance each of the **formula equations** below by putting coefficients in front of the formulae. Show your working in the spaces below.
    1. Zinc + Oxygen 🡪 Zinc oxide

Zn + O2 🡪 ZnO

Zn = Zn =

O = O =

* 1. Calcium oxide + Hydrochloric acid 🡪 Calcium chloride and water

CaO + HCl 🡪 CaCl2 + H2O

Ca = Ca =

O = O =

H = H =

Cl = Cl =

* 1. Methane + Oxygen 🡪 Water + Carbon dioxide

CH4 + O2 🡪 H2O + CO2

* 1. Magnesium + Sulphuric acid → Magnesium sulphate + Hydrogen

Mg + H2SO4 🡪 MgSO4 + H2

* 1. Iron + Oxygen 🡪 Iron oxide

Fe + O2 🡪 Fe2O3

* 1. Sulphuric acid + Sodium → Sodium sulphate + Hydrogen

H2SO4 + Na 🡪 Na2SO4 + H2

* 1. Iron + Hydrochloric acid → Iron chloride + Hydrogen gas

Fe + HCl 🡪 FeCl3 + H2