GCSE and IGCSE Chemistry: Atomic Structure Worksheet

Year 10-11 · GCSE (AQA 4.1) and Cambridge IGCSE 0620 topics 2 and 9 · Exam-style questions

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 65

Section A: Sub-atomic particles [25 marks]

1 Complete the table about sub-atomic particles. **[9]**

Particle	Relative mass	Relative charge	Location in the atom
Proton			
Neutron			
Electron			

2 Define: (a) atomic number, (b) mass number, (c) isotopes. **[4]**

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3 Complete the table for each particle. **[12]**

Particle	Atomic number	Mass number	Protons	Neutrons	Electrons
Sodium atom	11	23			
Chloride ion Cl^-	17	35			
Magnesium ion Mg^{2+}	12	24			
Oxide ion O^{2-}	8	16			

Section B: Electron configuration and the periodic table [20 marks]

4 Write the electron configuration for each atom and state its group and period. **[12]**

Atom	Electron configuration	Group	Period
Sodium (11)			
Chlorine (17)			
Calcium (20)			
Argon (18)			

5 Explain why elements in the same group have similar chemical properties. **[2]**

6 Chlorine has two isotopes: chlorine-35 (75%) and chlorine-37 (25%). Calculate the relative atomic mass of chlorine. **[3]**

7 Copper has two isotopes: copper-63 (69%) and copper-65 (31%). Calculate the relative atomic mass to one decimal place. **[3]**

Section C: Group trends [11 marks]

8 Explain why potassium is more reactive than lithium. Use the idea of electron structure. **[3]**

9 Chlorine gas is bubbled through potassium bromide solution. Write the word equation and describe what you would see. **[3]**

10 Explain why bromine does not displace chlorine from sodium chloride solution. **[2]**

11 Explain why noble gases are unreactive. **[1]**

12 State two properties of transition metals that are different from Group 1 metals. **[2]**

Section D: Development of the atomic model [9 marks]

13 Match each scientist to their idea. Choose from: Dalton, Thomson, Rutherford, Bohr. **[4]**

Idea	Scientist
Atoms are tiny solid spheres that cannot be divided	
Atom is a ball of positive charge with negative electrons embedded (plum pudding)	
Atom has a tiny, dense, positive nucleus with electrons around it	
Electrons orbit the nucleus in fixed energy levels (shells)	

14 In the alpha scattering experiment, most alpha particles passed straight through gold foil, a few were deflected and a very few bounced back. State what each observation showed about the atom. **[3]**

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15 Explain why the plum pudding model was replaced by the nuclear model. **[2]**

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