Atomic Structure

GCSE Science • **Combined and Triple** • Grades 3–6

Name: _____ Class: _____ Total: _____ / 52

Show all your working. Marks are given for correct method as well as the final answer.

1. Name the three sub-atomic particles and give the charge of each. **[3 marks]**

Answer: _____

2. State where in the atom the protons and neutrons are found. **[1 mark]**

Answer: _____

3. Explain why an atom has no overall charge. **[2 marks]**

Answer: _____

4. Define the atomic number of an element. **[1 mark]**

Answer: _____

5. Define the mass number of an atom. **[1 mark]**

Answer: _____

6. Sodium has atomic number 11 and mass number 23. Work out the number of neutrons. **[2 marks]**

Answer: _____

7. For that sodium atom, write down the number of electrons. **[1 mark]**

Answer: _____

8. A chlorine atom has 17 protons and 18 neutrons. Write down its mass number. **[1 mark]**

Answer: _____

9. An ion has 12 protons and 10 electrons. Work out its charge. **[2 marks]**

Answer: _____

10. Define an isotope. **[2 marks]**

Answer: _____

11. Explain why isotopes of an element react in the same way. **[2 marks]**

Answer: _____

12. Chlorine is 75% chlorine-35 and 25% chlorine-37. Work out its relative atomic mass. **[4 marks]**

Answer: _____

13. Write down the electronic structure of an atom with 11 electrons. **[2 marks]**

Answer: _____

14. Write down the electronic structure of an atom with 17 electrons. **[2 marks]**

Answer: _____

15. An element has the electronic structure $2, 8, 2$. Write down which group of the periodic table it is in. **[2 marks]**

Answer: _____

16. Explain why the elements in group 0 are unreactive. **[2 marks]**

Answer: _____

17. Explain why reactivity increases down group 1. **[3 marks]**

Answer: _____

18. Explain why reactivity DECREASES down group 7. **[3 marks]**

Answer: _____

19. The model of the atom has changed over time.

(a) Describe the plum pudding model. **[2 marks]**

(b) Describe what the alpha scattering experiment showed. **[3 marks]**

Answer: _____

20. Magnesium has the symbol $^{24}_{12}Mg$.

(a) Write down the numbers of protons, neutrons and electrons. **[3 marks]**

(b) Write down the electronic structure and hence the group. **[3 marks]**

Answer: _____

21. An atom of an element has 19 protons and 20 neutrons.

(a) Work out its mass number. **[1 mark]**

(b) Work out its electronic structure and predict how reactive it is. **[4 marks]**

Answer: _____

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