

Year 9 Science 2024

## Chemistry Test 1: Atoms

### SECTION 1: MULTIPLE CHOICE (1 mark each)

Circle your answer on the multiple choice answer sheet.

1. If a substance is made up just one type of atom it is referred to as:  
a) a molecule  
b) an isotope  
c) a lattice  
☒ d) an element
2. A compound is best described as:  
a) a substance made of molecules  
b) a substance made of only one type of atoms  
☒ c) a substance made of elements which are chemically combined  
d) a substance made of metals and non-metals
3. Which of the following shows the formula of an element?  
a)  $C_6H_{12}O_6$   
☒ b) Fe  
c)  $MgCl_2$   
d)  $H_2SO_4$
4. Which type of particles is not found in the nucleus of an atom?  
a) proton  
b) neutron  
☒ c) electron  
d) all of the above
5. Which of the following is not true about protons?  
a) They have a mass of  $1/12$  of the mass of a carbon atom.  
b) They have a relative mass of 1  
c) They have a charge of +1  
☒ d) They always equal the number of neutrons.
6. For any isotope, the number of protons + the number of neutrons is equal to:  
a) the atomic number  
b) the relative atomic weight  
☒ c) the mass number  
d) the number of electrons

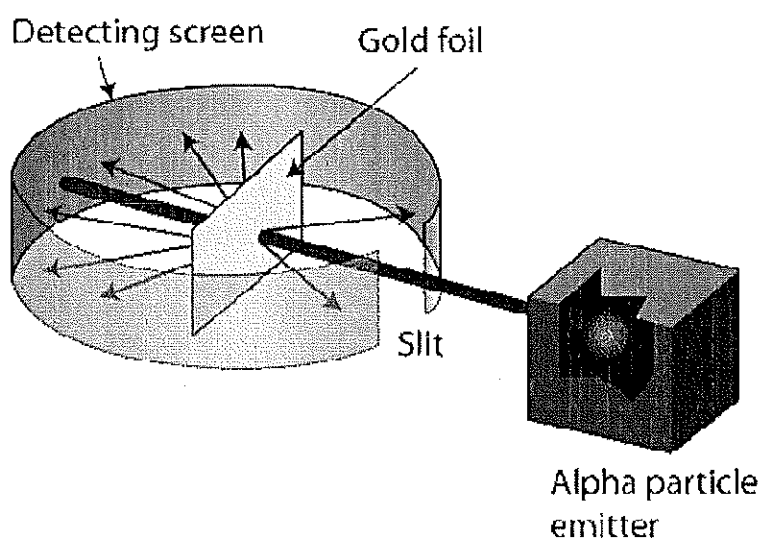
7. An atom has 11 protons, 12 neutrons and 10 electrons it is:

- a) an isotope of magnesium
- ☒ b) an ion of sodium
- c) an atom of neon
- d) radioactive

8. In a neutral atom, the number of electrons is always:

- ☒ a) equal to the number of protons
- b) equal to the number of neutrons
- c) equal to the mass number
- d) equal to the charge

9. The Gold Foil experiment (below) was conducted by New Zealand scientist Ernest Rutherford.



The experiment showed that:

- a) atoms are indivisible
- ☒ b) most of the atom is empty space, with a small positively charged nucleus
- c) atoms contain both protons and neutrons in their nucleus
- d) electrons are found in shells depending on how much energy they have

10. Ions are atoms (or groups of atoms) that:

- a) have gained or lost electrons.
- b) are charged.
- c) are anions or cations.
- ☒ d) all of the above

11. Metals are described as lustrous because they:

- ☒ a) shine when polished
- b) can be bent into new shapes
- c) can be stretched into wires
- d) conduct both heat and electricity

12. Which of the following is not an alloy:
- a) brass
  - b) stainless steel
  - c) bronze
  - ☒ d) carbon dioxide
13. Which of the following is an alloy?
- a) iron
  - b) zinc
  - c) magnesium
  - ☒ d) steel
14. Metalloids act like non-metals in most ways, except that:
- a) they are usually gases at room temperature
  - ☒ b) they are able to conduct electricity under certain conditions
  - c) they melt at a higher temperature
  - d) they are brittle
15. Acids are:
- ☒ a) corrosive
  - b) bitter
  - c) always dangerous
  - d) non-conductors
16. Which is the best way to determine if a substance is an acid or base?
- a) taste it
  - b) test its conductivity
  - c) look at its formula
  - ☒ d) test its pH
17. Which of the following only contains bases?
- ☒ a) sodium hydroxide, calcium hydroxide, bicarb soda
  - b) sodium hydroxide, water, bicarb soda
  - c) sodium hydroxide, vinegar, hydrochloric acid
  - d) tap water, lemon juice, vinegar
18. What colour does litmus turn in acid?
- ☒ a) red
  - b) green
  - c) blue
  - d) purple

19. Isotopes are:

- a) atoms with the same number of protons but different number of neutrons
- b) atoms with the same atomic number but different mass number
- c) 'versions' of the same element
- ☒ d) all the above

20. The type of radiation with the biggest mass, the lowest speed and the lowest penetration (distance travelled through air) is:

- ☒ a) alpha
- b) beta
- c) gamma
- d) neutron

## SECTION 2: WRITTEN

Write all answers in the spaces provided. If you need more space, ask for some lined paper

21. Complete the table about subatomic particles (7 marks)

	protons	neutrons	electrons
Relative mass	1	1	1/1800
Charge	+1	0	-1
Location	nucleus	nucleus	electron cloud

22. Label the following as elements or compounds (4 marks)

a) carbon (C)

element

b) water (H<sub>2</sub>O)

compound

c) Sulfur dioxide (SO<sub>2</sub>)

compound

d) Oxygen (O<sub>2</sub>)

element

23. Complete the table for the following atom: (6 marks)

<sup>37</sup>  
<sup>17</sup>Cl

element name	Chlorine
atomic number	17
number of protons	17
number of neutrons	20
number of electrons	17
metal or non-metal	non-metal

24. List 5 properties of metals (5 marks)

- melting /bp
- conduct heat/elect
- ductile
- malleable
- lustrous

25. The following contains a list of properties and examples.

Classify each as acid, base or neutral (Tick any that apply)

(6 marks)

	acid	base	neutral
corrosive	✓	✓	
pH 7			✓
sour	✓		
bitter		✓	
conduct electricity	✓	✓	
turn indicator or litmus paper blue		✓	
vinegar	✓		
soap		✓	
distilled water			✓
Salt			✓

**End of test (out of 48)**