

Chemistry Subject Knowledge Audit

Complete this multiple choice quiz, using your own knowledge in 1 hour you will need a periodic table and a calculator for some of the questions.

Record your answers with a (x) in the appropriate box **on the separate answer sheet**.

Print off and bring completed answer sheets to the first lesson of the year.

1. What piece of equipment would you use to measure the volume of acid required to neutralise a base?
 - a) Measuring cylinder
 - b) Burette
 - c) Conical Flask
 - d) Pipette

2. What dependant variable would you measure if you were trying to establish the effect of temperature on the rate of reaction between marble chips and hydrochloric acid?
 - a) Time
 - b) Gas volume
 - c) Colour
 - d) Temperature

3. John carried out an experiment to find out if magnesium increased or decreased in mass when it reacted with oxygen. To do so he weighed a piece of magnesium ribbon before and after heating it in a crucible.
What **two** ways could John ensure his results are more accurate? (mark 2 boxes on the answer sheet)
 - a) Use a bigger piece of magnesium
 - b) Put a lid on the crucible
 - c) Heat it for longer
 - d) Repeat his experiment 5 times

4. How could John make his results more reliable?
 - a) Use a bigger piece of magnesium
 - b) Put a lid on the crucible
 - c) Heat it for longer
 - d) Repeat his experiment 5 times

5. What does n equal if $PV = nRT$?
 - a) $PV-RT$
 - b) $RT-PV$
 - c) RT/PT
 - d) PV/RT

6. Calculate $10/500$ to 3 significant figures?
- 0.0200
 - 0.05
 - 0.02
 - 2×10^{-2}
7. What is 0.00000000005 in standard form?
- 5×10^{-12}
 - 5×10^{-12}
 - 5×10^{10}
 - 5×10^{-11}
8. Round the following number to 3d.p, 0.004478
- 0.005
 - 4.478
 - 0.004
 - 0.445
9. The definition of an Isotope is:
- Atoms of an element with the same number of proton and neutrons but a different number of electrons.
 - Atoms of an element with the same number of proton and electrons but a different number of neutrons.
 - Radioactive elements.
 - Atoms of an element with the same number of neutrons and electrons but a different number of protons.
10. A particle has 11 protons, 10 electrons and 10 neutrons, what is it?
- A sodium atom
 - A magnesium atom
 - A neon ion
 - A sodium ion
11. 58 is the ...
- Relative Atomic mass of sodium chloride
 - The RFM of sodium chloride
 - The M_r of sodium chloride
 - Relative Atomic weight of sodium chloride
12. Nitrogen has two naturally occurring isotopes N^{14} and N^{15} , the former has a relative abundance of 25% and the former of 75%. The relative atomic mass of Nitrogen is...
- 14.75
 - 15

- c) 14.50
- d) 14.25

13. What is the formula of lithium nitrate?

- a) LiNO_2
- b) Li_3N
- c) LiNO_4
- d) LiNO_3

14. Which equation correctly represent the reaction of calcium metal and water?

- a) $2\text{Na}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaOH}_{(aq)} + \text{H}_{2(g)}$
- b) $\text{Ca}_{(s)} + 2\text{H}_2\text{O}_{(aq)} \rightarrow \text{Ca}(\text{OH})_{2(aq)} + \text{H}_{2(g)}$
- c) $\text{Ca}_{(s)} + \text{H}_2\text{O}_{(l)} \rightarrow \text{Ca}(\text{OH})_{2(aq)} + \text{H}_{2(g)}$
- d) $\text{Ca}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow \text{Ca}(\text{OH})_{2(aq)} + \text{H}_{2(g)}$

15. How many moles of Iodine are there in 0.6g?

- a) 0.0024
- b) 0.0048
- c) 0.0058
- d) 0.0017

16. What volume does 0.5 moles of Cl_2 occupy?

- a) 24cm^3
- b) $1,200\text{cm}^3$
- c) 12lt
- d) $12,000\text{dm}^3$

17. What is the empirical formula of octane?

- a) CH_2
- b) C_4H_9
- c) C_2H_4
- d) C_2H_6

18. What mass of Iron sulphide (FeS) is produced when 0.0056kg of iron reacts completely with excess sulphur.

- a) 4.4g
- b) 8.8g
- c) 8.8kg
- d) 9.04g

19. How many moles of hydrogen gas will be made when 0.5 moles of sodium reacts according to this equation $2\text{Na}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaOH}_{(aq)} + \text{H}_{2(g)}$
- 0.5
 - 1
 - 0.25
 - 0.3
20. Alcohol can be produced by fermentation. What is the atom economy of this fermentation reaction? $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$
- 51%
 - 25%
 - 48%
 - 24%
21. Which of these are not strong acids?
- HCl
 - H_2SO_4
 - CH_3COOH
 - H_3PO_4
22. Which of these is not an alkali?
- NaOH
 - $\text{Ca}(\text{OH})_2$
 - MgO
 - NH_3
23. Which of these indicators would not be appropriate to use in an acid base titration?
- Phenolphthalein
 - Litmus
 - Methyl orange
 - Universal
24. Which metal ion has the largest charge in the following compounds?
- Iron(II)chloride
 - Vanadium(V)oxide
 - Aluminium Nitrate
 - Manganese (VII)sulphate
25. Which of these statements is false?
- An oxidising agent loses electrons
 - When a substance is oxidised it loses electrons

- c) A reducing agent gains electrons
- d) When a substance is oxidised it gains electrons.

26. Which of these reactions are not redox reactions.

- a) $\text{Na} + \text{LiCl} \rightarrow \text{NaCl} + \text{Li}$
- b) $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HClO} + \text{HCl}$
- c) $\text{CO} + \text{NO} \rightarrow \text{N}_2 + \text{CO}_2$
- d) $\text{CuSO}_4 + 2\text{NaOH} \rightarrow \text{Cu}(\text{OH})_2 + \text{Na}_2\text{SO}_4$

27. Which of these compounds does not involve covalent bonding?

- a) HCl
- b) H_2O
- c) Al_2O_3
- d) CH_4

28. How many electrons are involved in a triple bond.

- a) 3
- b) 6
- c) 9
- d) 12

29. Diamond has a high boiling point because

- a) There are strong intermolecular forces between carbon atoms
- b) Large numbers of strong covalent bonds between carbon atoms
- c) Electrostatic forces between ions in the lattice are strong.
- d) It has a crystalline structure.

30. Which of these is the best electrical conductor?

- a) Al
- b) Mg
- c) Ca
- d) Li

31. Predict which of these are the least reactive.

- a) Beryllium
- b) Strontium
- c) Radium
- d) Barium

32. Adding Silver nitrate solution to a solution containing Iodide ions results in what colour precipitate?

- a) Turquoise
- b) White
- c) Yellow
- d) Cream

33. Which statements about catalysts are not true?

- a) They are not used up in chemical reactions.
- b) They increase the rate and yield
- c) They increase the yield but not rate.
- d) In reversible reactions they increase the rate of both forward and reverse reactions.

34. Which of the following statements about this equilibrium $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ is true. (the forwards reaction is exothermic)

- a) Increase the temperature increase the yield of ammonia but not the rate
- b) Increasing the pressure will increase the yield of ammonia and the rate
- c) Decreasing the temperature will reduce the yield of ammonia and rate
- d) Decreasing the pressure will increase the yield of ammonia but decrease the rate

35. What is the general formula for alkanes?

- a) $\text{C}_n\text{H}_{(2n+2)}$
- b) C_nH_{2n}
- c) $\text{C}_{2n}\text{H}_{2n+1}$
- d) C_nH_{n+2}

36. What is the name of the substance formed from the reaction of an alcohol and an organic acid?

- a) Aldehyde
- b) Carboxylic acid
- c) Ketone
- d) Ester

37. What is always a product of combustion?

- a) Carbon dioxide
- b) Soot
- c) Carbon monoxide
- d) Water

38. Which of the following is a chlorine radical?

- a) A chlorine anion
- b) A chlorine molecule
- c) A chlorine atom
- d) A chlorine

39. What product is made when bromine water is reacted with ethene?

- a) dibromoalkane
- b) bromomethane
- c) dibromoethene
- d) dibromoethane

40. Which scientist discovered the neutron?

- a) Chadwick
- b) Rutherford.
- c) Thompson
- d) Bohr