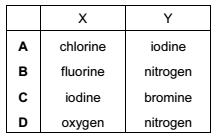
**MCQ B**

1 Sulphur and selenium (Se) are in the same group of the Periodic Table.  
From this, we would expect selenium to form compounds having the formulae  
A SeO, Na2Se and NaSeO4.  
B SeO2, Na2Se and NaSeO4.  
C SeO2, Na2Se and Na2SeO4.  
D SeO3, NaSe and NaSeO4.

Your answer

2 X and Y are diatomic elements. X is less reactive than Y.  
What are elements X and Y?

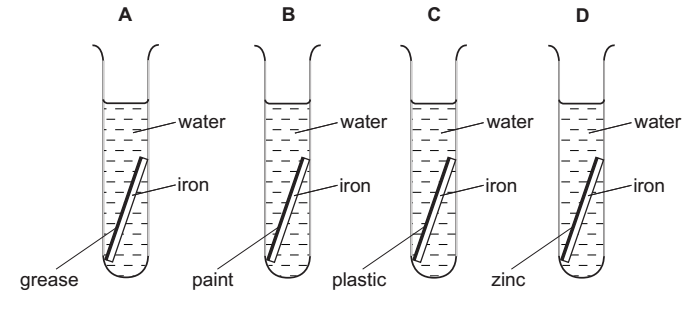


Your answer

3 A metal X, in Group I of the Periodic Table, would be expected to  
A form a nitrate of formula X(NO3)2.  
B form an acidic oxide.  
C form an insoluble chloride.  
D produce hydrogen from cold water.

Your answer

4 Four test-tubes were set up as shown.  
Each piece of iron was protected on one side by a different coating.  
In which test-tube is the iron least likely to rust?



Your answer

5 Aluminium is used to make saucepans because of its apparent lack of reactivity.  
Which property of aluminium explains its unreactivity ?

A It has a high electrical conductivity.

B It has a low density.

C It has a surface layer of oxide.

D It is in Group 3 of the Periodic Table.

Your answer

6 A solid substance Z burns in air to form a product that is gaseous at 20°C.  
What is Z?

A hydrogen

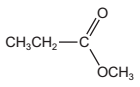
B carbon monoxide

C carbon

D magnesium

Your answer

7 Carboxylic acids react with alcohols to form esters.  
Which acid and alcohol react together to form the following ester?



A propanoic acid and ethanol

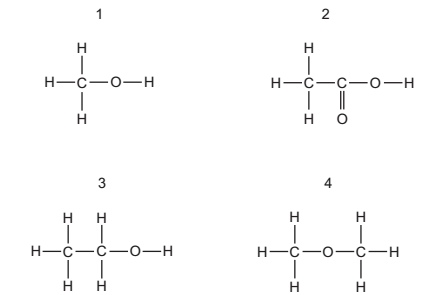
B propanoic acid and methanol

C ethanoic acid and ethanol

D ethanoic acid and methanol

Your answer

8 Which two compounds are members of the same homologous series?



A 1 and 2

B 1 and 3

C 1 and 4

D 2 and 4

Your answer

9 Which compound has more than two carbon atoms per molecule?

A ethyl ethanoate

B ethene

C ethane

D ethanoic acid

Your answer

10 Alkanes are a homologous series of organic compounds.  
Which statement about alkanes is correct?

A Their boiling points increase as the length of the carbon chain increases.

B Their general formula is CnH2n.

C They are unsaturated hydrocarbons.

D They take part in addition reactions.

Your answer

11 Which property of a gas affects the rate at which it spreads throughout a laboratory?

A boiling point

B molecular mass

C reactivity

D solubility in water

Your answer

12 Which pair of substances are both mixtures?

Aair; water

Blimewater; water

Csea-water; air

Dsea-water; ethanol

Your answer

13 In which substance is each carbon atom covalently bonded to only three other atoms?

A carbon dioxide

B diamond  
C graphite  
D methane

Your answer

14 In which pair of substances does each have a giant molecular structure?  
A diamond, iodine  
B diamond, silica (sand)  
C iodine, methane  
D methane, silica (sand)

Your answer

15 How does a magnesium atom form a bond with an oxygen atom?  
A by giving one pair of electrons to the oxygen atom  
B by sharing one pair of electrons, both electrons provided by the magnesium atom  
C by sharing two pairs of electrons, both pairs provided by the oxygen atomD by sharing two pairs of electrons, each atom donating one pair of electrons

Your answer

16 Metals have positive ions in a ‘sea of electrons’.  
Which metal atom provides most electrons for the sea?

A aluminium B calcium

C magnesium D sodium

Your answer

17 The element X forms a gaseous molecule X2. One volume of X2 combines with one volume of hydrogen to form two volumes of a gaseous hydride.  
What is the formula for the hydride of X?

A HX B HX2

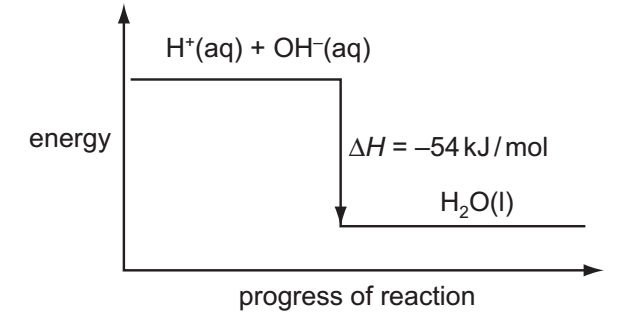
C H2X D H2X2

Your answer

18 Which substance has the highest percentage by mass of nitrogen?  
A NH4NO3 Mr = 80  
B (NH4)2SO4 Mr = 132  
C CO(NH2)2 Mr = 60  
D (NH4)3PO4 Mr = 149

Your answer

19 The energy diagram for the reaction between sodium hydroxide and hydrochloric acid is shown.



What can be deduced from the diagram?

A Heat is needed to start the reaction.  
B The products contain less energy than the reactants.  
C The reaction is rapid.  
D The OH– ions have more energy than the H+ ions.

Your answer

20 The equation shows the reaction for the formation of sulfur trioxide.

2SO2(g) + O2(g) qe 2SO3(g) ∆H = –197kJ

Which change in reaction conditions would produce more sulfur trioxide?

A adding more catalyst

B decreasing the pressure  
C increasing the temperature  
D removing some sulfur trioxide

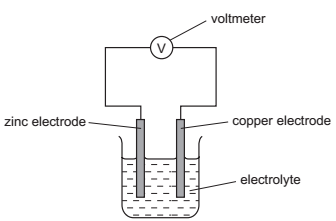
Your answer

21 Which substance, when added to water, does not make a solution that is a good

conductor of electricity?  
A barium nitrate  
B calcium chloride  
C lead(II) nitrate  
D zinc carbonate

Your answer

22 A simple cell is shown below.



Which statement about the process occurring when the cell is in operation is correct?  
A Cu2+ ions are formed in solution.  
B Electrons travel through the solution.  
C The reaction Zn → Zn2+ + 2e- occurs.  
D Zinc increases in mass.

Your answer

23 The usual conditions for the Haber process are 250 atm pressure, 450°C and an iron

catalyst.  
Which change in conditions would give the reactants more energy?

A addition of more catalyst  
B a decrease in pressure  
C an increase in concentration of the reactants  
D an increase in temperature

Your answer

24 Chlorine can be manufactured by the following reaction.

4HCl(g) + O2(g) → 2H2O(g) + 2Cl2(g) ∆H is negative

A mixture in dynamic equilibrium is formed.  
Which change to the mixture will increase the amount of chlorine at equilibrium?

A adding a catalyst  
B adding more HCl(g)  
C decreasing the pressure  
D increasing the temperature

Your answer

25 Equations for reactions of iron and iron compounds are shown.

Fe + 2HCl → FeCl2 + H2  
2FeCl2 + Cl2 → 2FeCl3  
FeSO4 + Mg → Fe + MgSO4  
FeSO4 + 2NaOH → Fe(OH)2 + Na2SO4

How many of these are redox reactions?

A 1 B 2

C 3 D 4

Your answer

26 Which is a use of sulfuric acid?  
A as a bleach  
B in the manufacture of ammonia  
C in the manufacture of fertilisers  
D in the manufacture of sulfur trioxide

Your answer

27 A metal M forms a chloride which dissolves in cold water and has an oxide which dissolves in both strong acids and strong alkalis.  
What is M?

A iron B lead

C sodium D zinc

Your answer

28 Which element has a variable oxidation state, can act as a catalyst and forms coloured compounds?

A carbon B iron

C lead D nitrogen

Your answer

29 An atom of which element has the same electronic configuration as the strontium ion?

A calcium B krypton

C rubidium D selenium

Your answer

30 The boiling points of gaseous elements increase as the size of their atoms increases.  
Which of these noble gases has the highest boiling point?

A argon

B helium

C krypton

D neon

Your answer