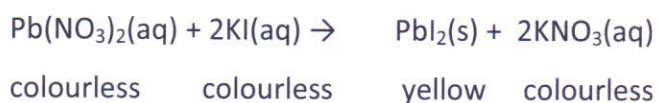


1. The equation for the reaction between aqueous lead (II) nitrate and aqueous potassium iodide is shown:



Which method could be used to separate the products?

- A. chromatography
 - B. crystallization
 - C. distillation
 - D. filtration
2. Gas X
- has no effect either on damp red litmus paper or on damp blue litmus paper,
 - puts out both a glowing splint and a burning splint.

What is gas X?

- A. ammonia
 - B. carbon dioxide
 - C. chlorine
 - D. nitrogen
3. Which statement about the reaction of acids is correct?
- A. They react with ammonium salts to form a salt and ammonia only.
 - B. They react with metal carbonates to give a salt and carbon dioxide only.
 - C. They react with metal hydroxides to give a salt and water only.
 - D. They react with metals to give a salt, hydrogen and water only.

4. An excess of calcium hydroxide is added to an acidic soil.

What happens to the pH of the soil?

	change in pH	final pH
A	decrease	5
B	decrease	7
C	increase	7
D	increase	10

5. Salts are made by reacting acids with bases.

For which combination of acids and bases is the titration method of preparation suitable?

- A. an insoluble acid with an insoluble base
- B. an insoluble acid with a soluble base
- C. a soluble acid with an insoluble base
- D.** a soluble acid with a soluble base

6. In the molecules CH_4 , HCl and H_2O , which atoms use all of their outer shell electrons in bonding?

- A. C and Cl
- B.** C and H
- C. Cl and H
- D. H and O

7. The diagram shows the positions of some elements in the Periodic Table.

W																				Z
	X																			
																			Y	

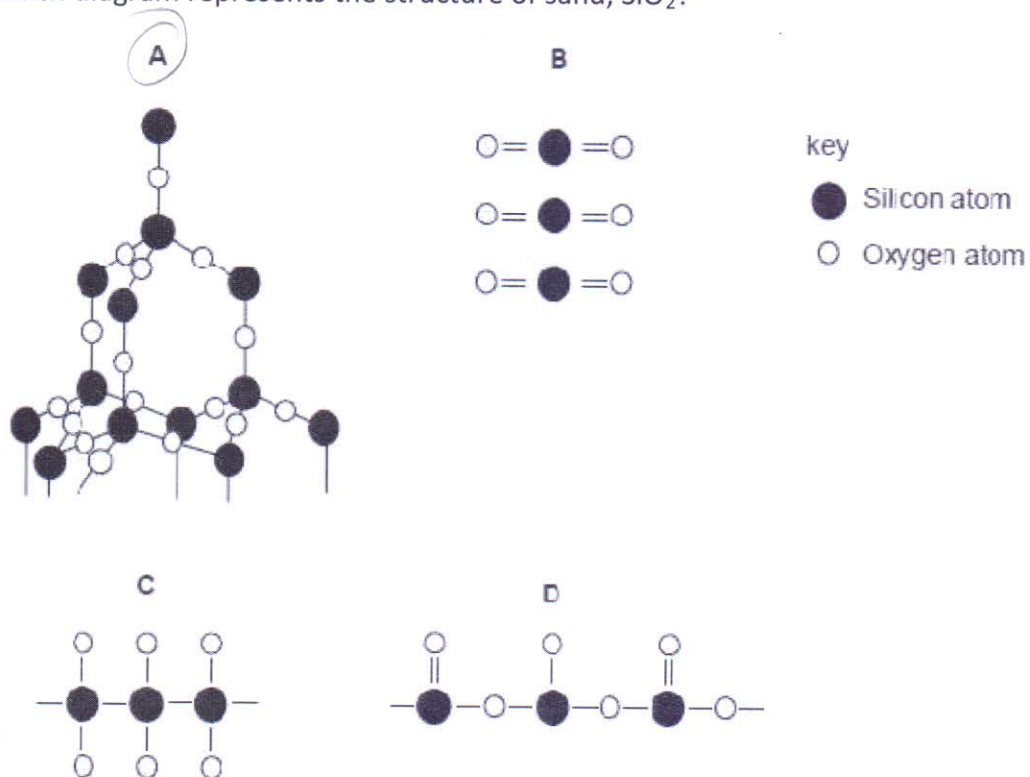
Which elements form ionic bonds with oxygen?

- A. W only
- B. W and X only
- C. Y only
- D. Y and Z only

8. 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 atom
- D. by sharing two pairs of electrons, each atom donating one pair of electrons

9. Which diagram represents the structure of sand, SiO₂?



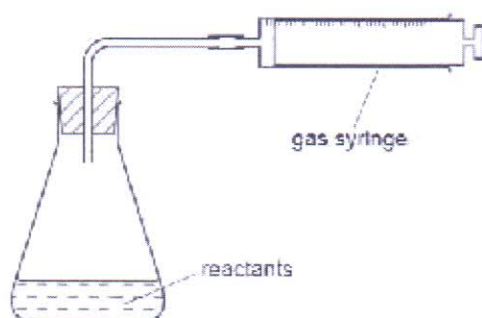
10. The reaction $C_2H_4 + 3O_2 \rightarrow 2CO_2 + 2H_2O$ is exothermic because

- A. more bonds are broken than are formed.
- B. more bonds are formed than are broken.
- C. the energy needed to break the bonds is greater than that released on forming new bonds.
- D.** the energy needed to break the bonds is less than that released on forming new bonds.

11. Which of the following changes is endothermic?

- A. $H(g) + Cl(g) \rightarrow HCl(g)$
- B.** $H_2O(g) \rightarrow 2H(g) + O(g)$
- C. $H_2O(l) \rightarrow H_2O(s)$
- D. $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

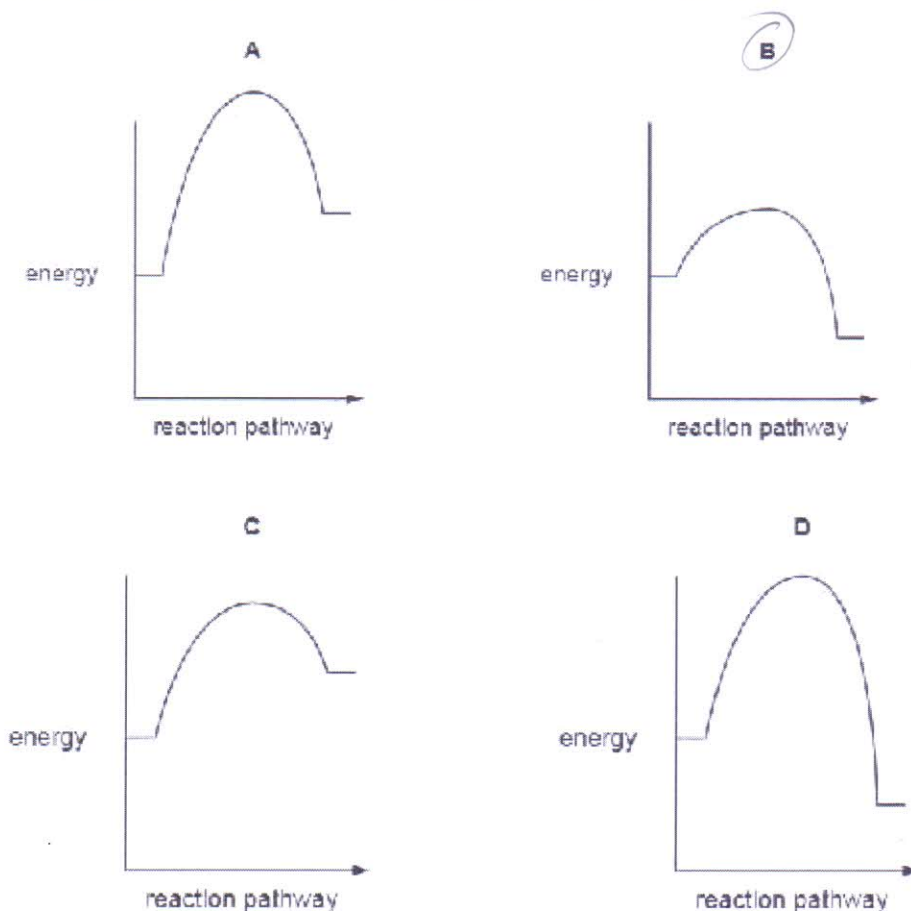
12. The apparatus shown is used to measure the speed of a reaction.



Which equation represents a reaction where the speed can be measured using this apparatus?

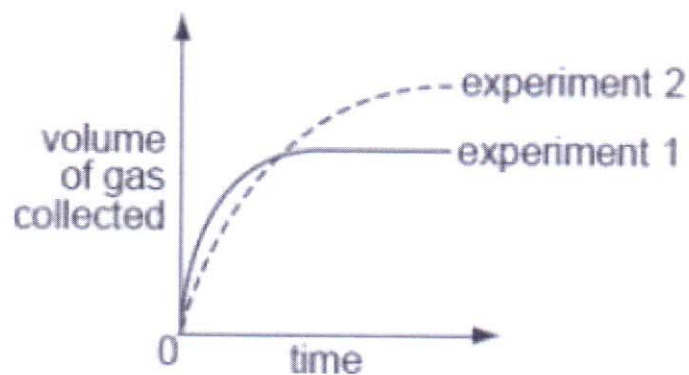
- A** $\text{Mg(s)} + 2\text{HCl(aq)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$
B $\text{HCl(aq)} + \text{NaOH(aq)} \rightarrow \text{NaCl(aq)} + \text{H}_2\text{O(l)}$
C $\text{Fe(s)} + \text{CuSO}_4\text{(aq)} \rightarrow \text{Cu(s)} + \text{FeSO}_4\text{(aq)}$
D $2\text{Na(s)} + \text{Br}_2\text{(l)} \rightarrow 2\text{NaBr(s)}$

13. Which reaction profile shows the fastest exothermic reaction?

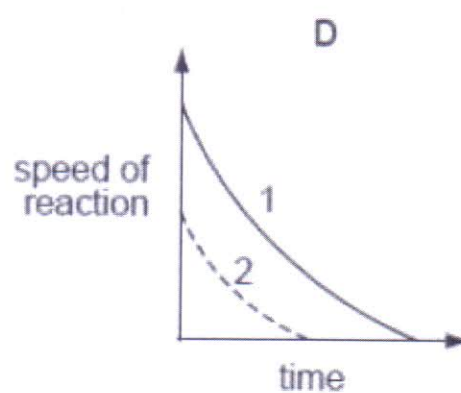
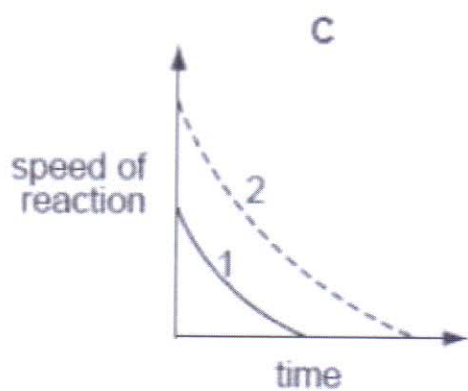
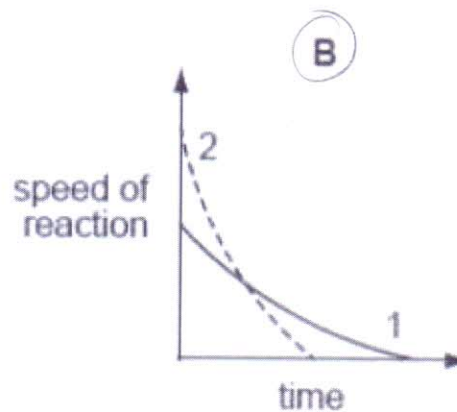
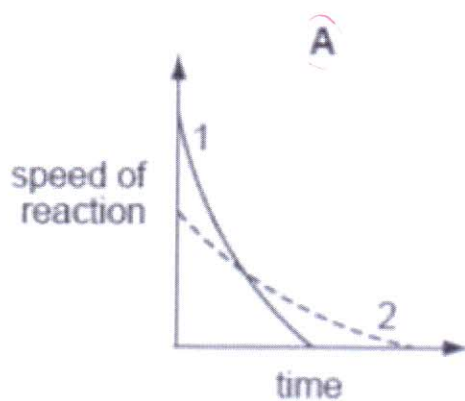


14. In two separate experiments, a substance is decomposed and the gas evolved is collected.

The graph shows the total volume of gas collected against time for each experiment.



Which graph shows how the speed of reaction varies with time in each experiment?



15. The equation for the reaction between magnesium and dilute sulfuric acid is shown.



M_r of MgSO_4 is 120

Mg : MgSO₄
24 : 120
12 : 60

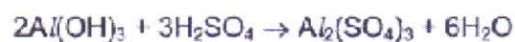
Which mass of magnesium sulfate will be formed if 12g of magnesium are reacted with sulfuric acid?

- A. 5g B. 10g **C. 60g** D. 120g

16. How many moles per dm³ of gaseous carbon dioxide are there if 4.4g occupies 500cm³?

- 0.1 : 500
20 : 1000
- A. 0.1 mol/dm³ **B. 0.2 mol/dm³** C. 2.2 mol/dm³ D. 8.8 mol/dm³

17. Aluminium sulphate can be obtained as shown in the equation



H₂SO₄ : Al₂(SO₄)₃
.3 : 1
20 : 0.5

How many moles of sulphuric acid are needed to produce 0.5 mol of aluminum sulphate?

- A. 0.5 B. 1.0 **C. 1.5** D. 3.0

18. In an experiment 264g of strontium reacts with 213g of chlorine.

$\frac{264}{87.62} = 3.01$ $\frac{213}{35.5} = 6$

What is the formula of strontium chloride?

- A. SrCl **B. SrCl₂** C. SrCl₃ D. Sr₂Cl

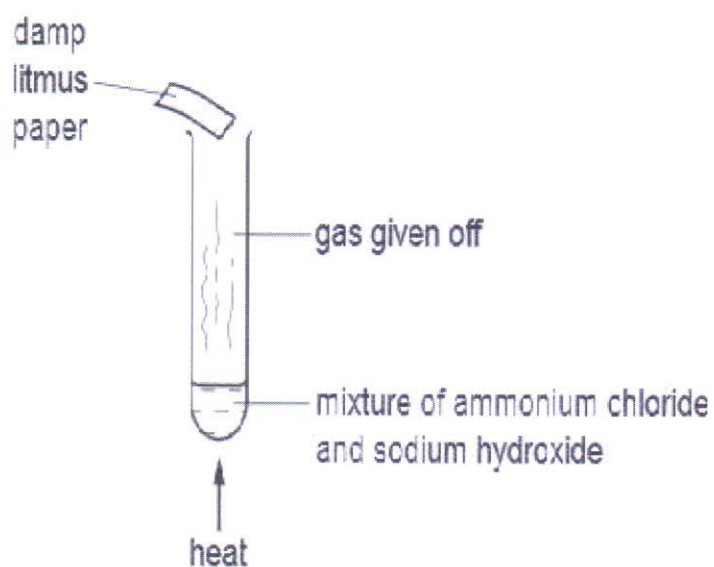


19. The element X forms a gaseous molecule X₂. One volume of X₂ combines with one volume of hydrogen to form two volumes of a gaseous hydride.

What is the formula for the hydride of X?

- A. HX** B. HX₂ C. H₂X D. H₂X₂

20. The diagram shows an experiment



What is the name of the gas and the final colour of the litmus paper?

	gas	colour
A	ammonia	blue
B	ammonia	red
C	chlorine	white
D	chlorine	red

21. A sample of tap water gave a white precipitate with acidified silver nitrate.

What does this show about the tap water?

- A.** It contained chloride.
- B.** It contained harmful microbes.
- C.** It contained nitrates.
- D.** It had not been filtered.

22. The results of tests carried out on compound X are shown.

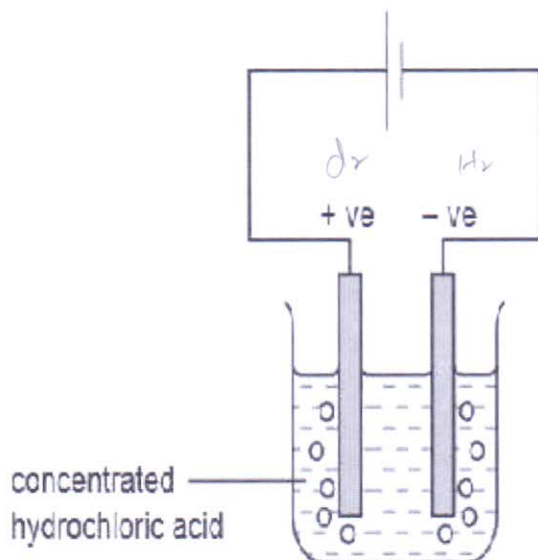
test	result
dilute hydrochloric acid added	gas given off which turned limewater cloudy
warm with aqueous sodium hydroxide	gas evolved which turned red litmus blue

What is compound X?

- A. ammonium carbonate
- B. ammonium nitrate
- C. calcium carbonate
- D. calcium nitrate

H_2 Cl_2

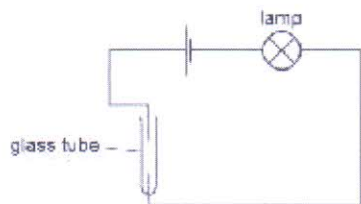
23. The diagram shows that two gases are formed when concentrated hydrochloric acid is electrolyzed between inert electrodes.



Which line correctly describes the colours of the gases at the electrodes?

	anode (+ve)	cathode (-ve)
A	colourless	colourless
B	colourless	yellow-green
<input checked="" type="radio"/> C	yellow-green	colourless
D	yellow-green	yellow-green

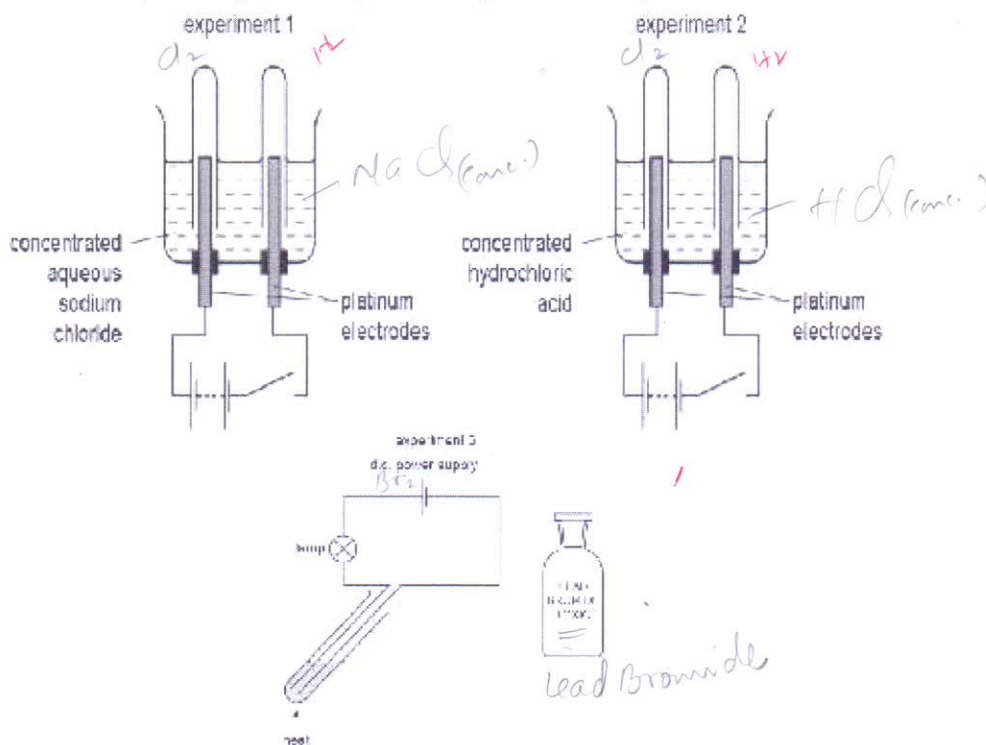
24. The diagram shows an incomplete circuit.



Which substance causes the lamp to light when added to the glass tube?

- A. aqueous sodium chloride
- B. aqueous sugar
- C. solid sodium chloride
- D. solid sugar

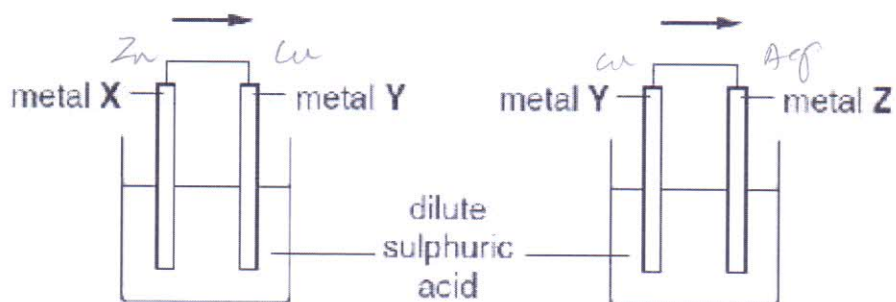
25. Concentrated aqueous sodium chloride, concentrated hydrochloric acid and molten lead bromide were separately electrolyzed in experiments 1, 2 and 3.



Which statement about the electrode products is correct?

- A. Gases were given off at the anode in experiments 2 and 3 only.
- B. Gases were given off at the cathode in experiments 1 and 2 only.
- C. Metals were formed at the anode in experiments 1 and 3 only.
- D. Metals were formed at the cathode in experiments 1 and 3 only.

26. Two cells were set up as shown in the diagram. The arrow shows the direction of electron flow in the external circuit.



Which set of metals would give the electron flows in the direction shown?

	metal X	metal Y	metal Z
A	Ag	Cu	Zn
B	Ag	Zn	Cu
C	Cu	Zn	Ag
D	Zn	Cu	Ag

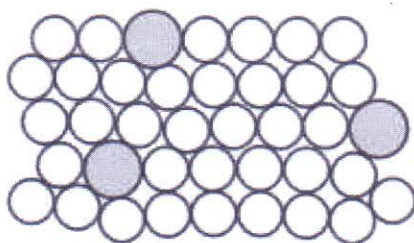
27. A substance, X, has the following properties.

1. It has a high melting point.
2. It conducts electricity in the solid and liquid states.
3. It is malleable.
4. It had a high density.

What is X?

- A. a ceramic
- B. copper
- C. graphite
- D. sodium chloride

28. The diagram represents the structure of substance S.



What is S?

- A. an alloy
- B. an ionic solid
- C. a macromolecule
- D. a pure metal

29. A lump of element Y can be cut by a knife. During its reaction with water, Y floats and melts.

What is Y?

- A. calcium
- B. copper
- C. magnesium
- D. rubidium

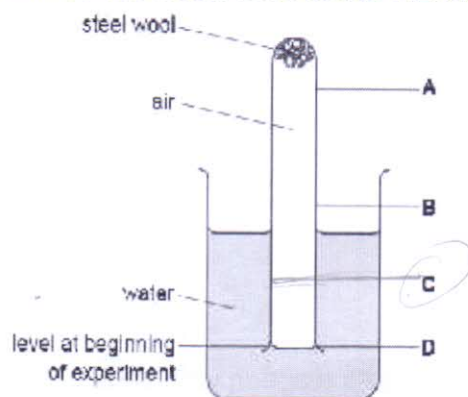
30. Which carbonate decomposes on heating to give a black solid and a colorless gas?

- A. calcium carbonate
- B. copper(II) carbonate
- C. sodium carbonate
- D. zinc carbonate

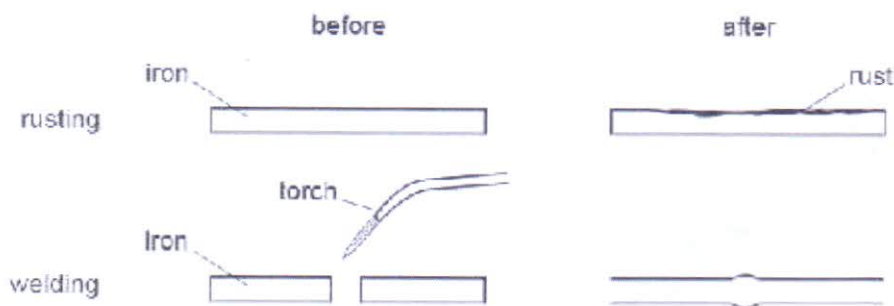
31. Which row shows the three metals in the correct order of decreasing reactivity?

	most active	→	least active
A	copper		zinc iron
B	iron		copper zinc
C	iron		zinc copper
D	zinc		iron copper

32. The diagram shows steel wool inside a test-tube. The test-tube is inverted in water, trapping air inside. What will be the water level inside the tube after several days?



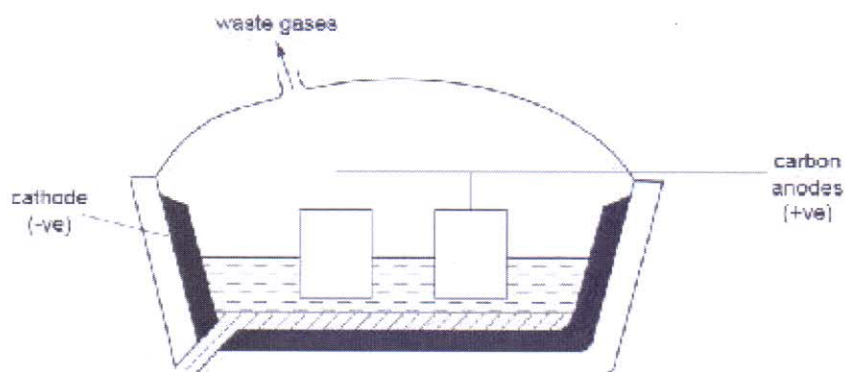
33. The diagrams show two processes.



For which processes is oxygen involved?

	rusting	welding
A	✓	✓
B	✓	x
C	x	✓
D	x	x

34. The diagram shows the electrolytic production of aluminum.



What is the physical state of the aluminium oxide and aluminium during this process?

	aluminium oxide	aluminium
<input checked="" type="radio"/> A	liquid	liquid
<input type="radio"/> B	liquid	solid
<input type="radio"/> C	solid	liquid
<input type="radio"/> D	solid	solid

35. Which compound has an addition reaction with chlorine?



36. The equation represents the conversion of starch to a simple sugar.



This reaction is an example of

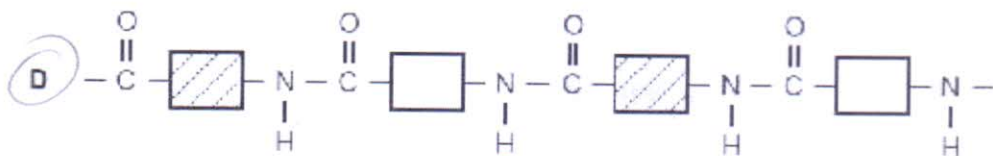
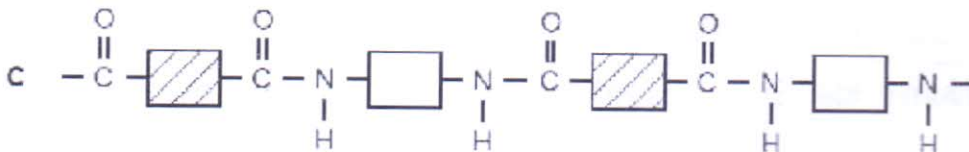
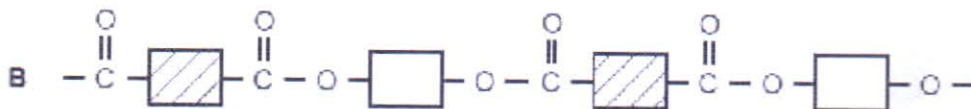
A. condensation.

B. hydrogenation.

C. hydrolysis.

D. polymerisation.

37. Which polymer would hydrolyse to amino acids?



38. In which pair of macromolecules are the linkages the same?

- A. fats and proteins
- B. nylon and fats
- C. nylon and proteins
- D. proteins and Terylene

39. Which statement applies to all three of the compounds ethane, ethene and ethanol?

- C_2H_6 C_2H_4 C_2H_5OH
- A. One molecule of each compound contains the same number of carbon atoms.
 - B. One mole of each compound contains the same number of hydrogen atoms.
 - C. They all occur in crude oil.
 - D. They are all liquids at room temperature.

40. Poly (ethene) can be manufactured by the process below.



Which diagram shows the change in molecular size during this process?

