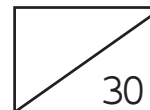


National 5 Chemistry in Society

Test 1



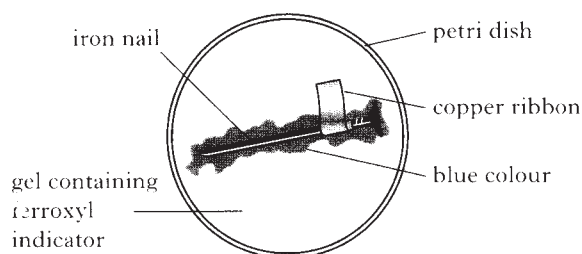
Name _____



1. Which two substances are required for corrosion of iron to occur?

A Nitrogen and carbon dioxide
B Nitrogen and oxygen
C Water and carbon dioxide
D Water and oxygen

2.



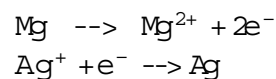
Which ion gives a blue colour with ferroxyl indicator?

A $\text{OH}^- (\text{aq})$
B $\text{Fe}^{2+} (\text{aq})$
C $\text{Fe}^{3+} (\text{aq})$
D $\text{Cu}^{2+} (\text{aq})$

3. Some metals can be obtained from their oxides by heat alone. Which of the following oxides would produce a metal when heated?

A Calcium oxide
B Copper oxide
C Zinc oxide
D Silver oxide

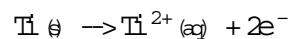
4. The ion-electron equation for the oxidation and reduction steps in the reaction between magnesium and silver(I) ions are:



The overall redox equation is

A $\text{Mg} + 2\text{Ag}^+ \rightarrow \text{Mg}^{2+} + 2\text{Ag}$
B $\text{Mg} + \text{Ag}^+ \rightarrow \text{Mg}^{2+} + \text{Ag}$
C $\text{Mg} + \text{Ag}^+ + \text{e}^- \rightarrow \text{Mg}^{2+} + \text{Ag} + 2\text{e}^-$
D $\text{Mg} + 2\text{Ag} \rightarrow \text{Mg}^{2+} + 2\text{Ag}^+$

5. The ion-electron equation



represents the

A reduction of titanium atoms
B reduction of titanium ions
C oxidation of titanium atoms
D oxidation of titanium ions.

6. Biopol is a polymer which is

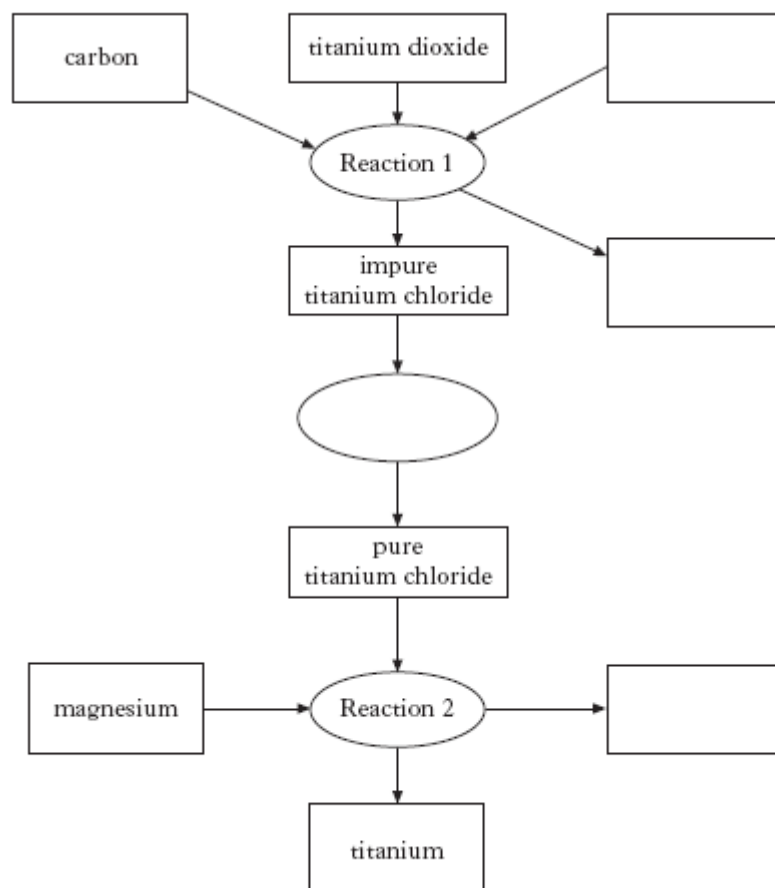
A natural and biodegradable
B synthetic and biodegradable
C natural and non-biodegradable
D synthetic and non-biodegradable

7. Which poisonous gas is always made when polymers burn?
- A Carbon monoxide
B Chlorine
C Carbon dioxide
D Cyanide
8. Which of the following pairs of metals would give the largest voltage if used in an electrochemical cell?
- A Copper and tin
B Tin and iron
C Iron and zinc
D Zinc and copper
9. Which element is not an essential component of fertilisers?
- A Carbon
B Nitrogen
C Potassium
D Phosphorus
10. What fraction of a radioactive substance will remain after 3 half lives?
- A $\frac{1}{2}$
B $\frac{1}{4}$
C $\frac{1}{6}$
D $\frac{1}{8}$
11. Polypropene softens when it is heated, this indicates that it is
- A biodegradable
B thermosetting
C synthetic
D thermoplastic
12. Which of the following could be made by precipitation?
- A Silver nitrate
B Silver chloride
C Sodium nitrate
D Sodium chloride
13. A water sample gives a yellow flame colour, which element is present in the water?
- A Chlorine
B Iron
C Sodium
D Potassium
14. An atom of Uranium emits an alpha particle, which element is formed in this change?
- A Thorium
B Protactinium
C Neptunium
D Plutonium
15. Galvanising involves covering iron with which metal?
- A Copper
B Tin
C Magnesium
D Zinc

16. Titanium is an important metal.

- a) Titanium can be extracted from titanium dioxide. The titanium dioxide is reacted with carbon and chlorine to produce impure titanium chloride and carbon dioxide. The impure titanium chloride is purified by distillation. Magnesium metal is added to the pure titanium chloride producing titanium and magnesium chloride.

Complete the flow chart to show the extraction process.



2

- b) A mixture of titanium and nickel is used to make the alloy, Nitinol. The composition of Nitinol is shown in the table.

Metal	titanium	nickel
percentage by mass	45	55

Calculate the mass of titanium in 20g of nitinol.

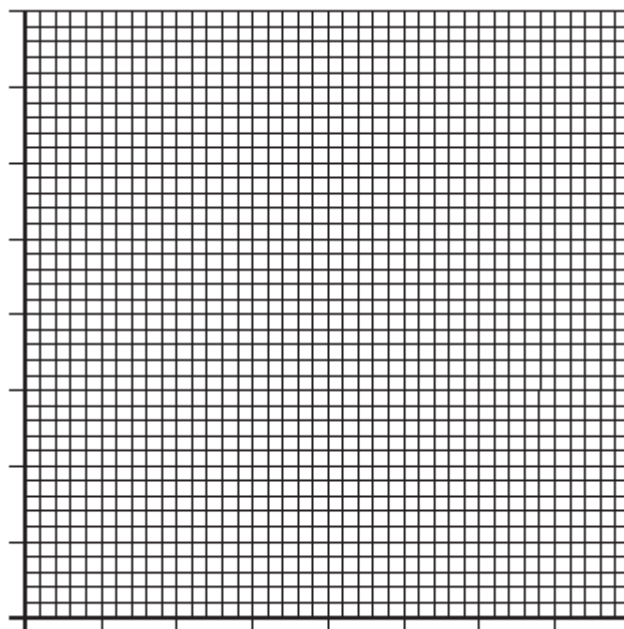
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(3)

17. Ammonia is made when nitrogen and hydrogen react together.
The table below shows the percentage yields obtained when nitrogen and hydrogen react at different pressures.

<i>Pressure/atmospheres</i>	<i>Percentage yield of ammonia</i>
25	28
50	40
100	53
200	67
400	80

- (a) Draw a line graph of percentage yield against pressure.
Use appropriate scales to fill most of the graph paper.



- (b) Use your graph to estimate the percentage yield of ammonia at 150 atmospheres.

.....%

- (c) Name the catalyst used to make ammonia.

18. The table contains information on minerals.

Mineral	Formula
cinnabar	HgS
fluorite	CaF_2
gibbsite	$\text{Al}(\text{OH})_3$
haematite	Fe_2O_3
zinc blende	ZnS

- (a) Calculate the percentage by mass of calcium in fluorite, CaF_2 .

1

- (b) Iron metal can be extracted from haematite, Fe_2O_3 by heating with carbon monoxide, carbon dioxide is produced in this reaction.

Write an equation using symbols and formulae, for this reaction.

There is no need to balance the equation.

1

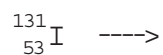
- (c) Name a metal which has to be extracted by electrolysis of the molten ore.

1

(9)

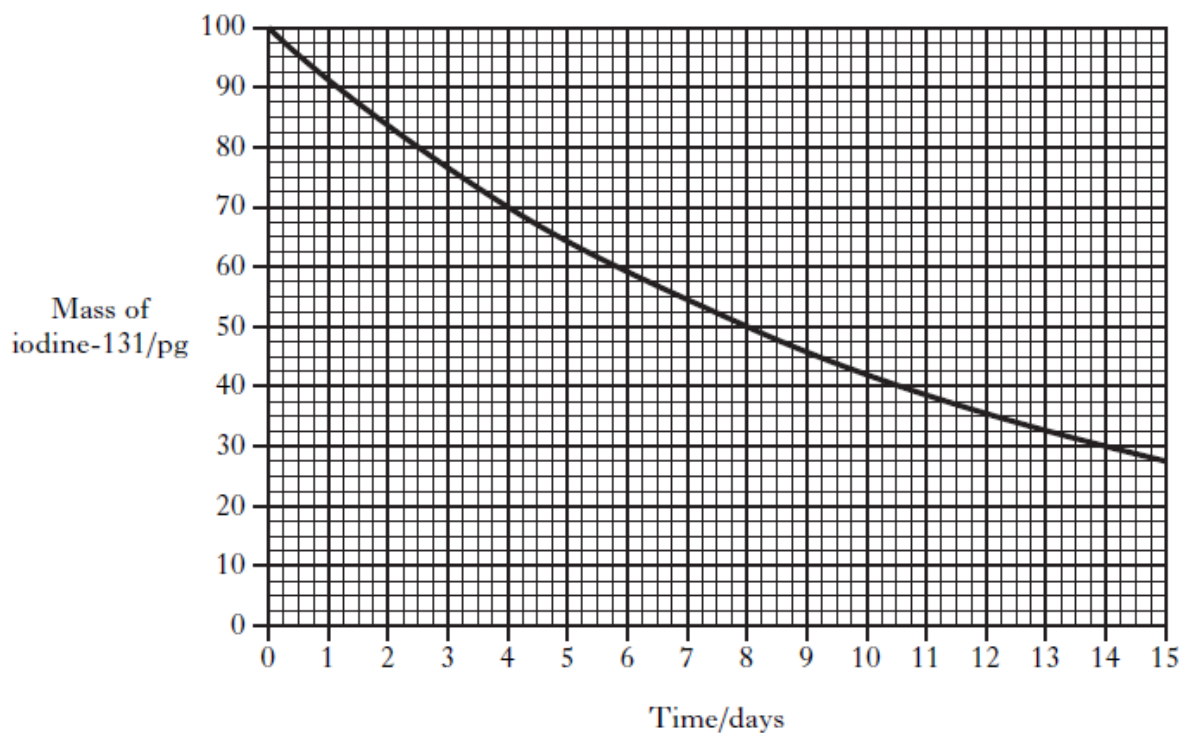
19. The element iodine has only one isotope that is stable. Several of the radioactive isotopes of iodine have medical uses. Iodine-131, for example, is used in the study of the thyroid gland and it decays by beta emission.

(a) Complete the following equation for beta decay of iodine 131



1

(b) The graph shows how the mass of iodine-131 in a sample changes over a period of time.



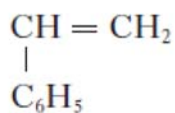
What is the half-life of this isotope?

..... days.

1

0

20. Polystyrene is made from the monomer, styrene. The systematic name for styrene is phenylethene.

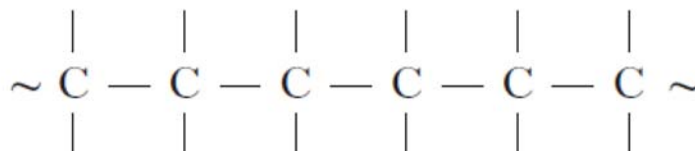


Styrene (phenylethene)

- (a) The monomer used to form polystyrene is shown. Which part of the structure of styrene allows the polymer to form?

1

- (b) Complete the diagram to show how three styrene molecules join to form part of the polymer chain.



- (c) Give another name for polystyrene.

1

1

(3)

[End of Question paper]

