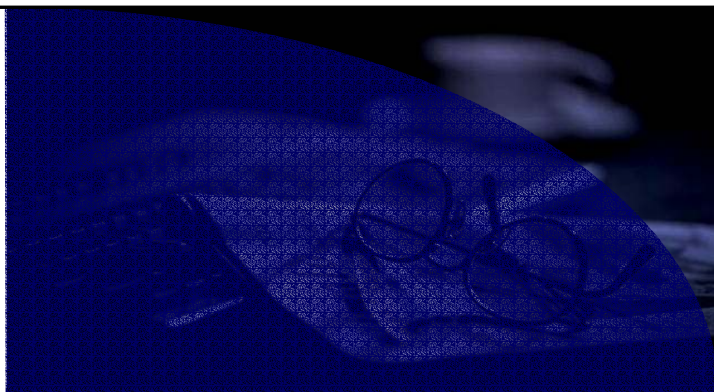


assessment for learning

year 9



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9F Patterns of reactivity

Assessment for learning...year 9 (level 3-6)

Answer all questions:

Total marks	24
Time allowed	25 mins.

Question 1:

The table gives information about the colours of four metals.

metal	colour of metal
copper	brown
iron	dark grey
magnesium	silver
zinc	light grey

A reactivity series of the metals is:

most reactive

magnesium

zinc

iron

least reactive

copper

Use this information to help you answer the questions below.

(a) A piece of zinc was placed in a solution of copper sulphate.

(i) Complete the following word equation.

zinc + copper sulphate → +

1 mark

(ii) Complete the statement about the appearance of this piece of zinc.

The light grey colour would change to

1 mark

(b) Excess magnesium powder was put into a test tube containing a blue solution of copper sulphate and stirred. The solution soon turned colourless. A powder settled on the bottom of the test tube.

(i) Write a word equation for the reaction.

.....
.....

1 mark

(ii) The powder was filtered off. Two different coloured solids could be seen. Give the **two** colours.

1.

2.

2 marks

(c) (i) A piece of iron was placed in a solution of magnesium sulphate. What reaction, if any, would occur?

.....

1 mark

(ii) Explain your answer.

.....
.....

1 mark

Maximum 7 marks

Question 2:

The table gives information about solutions of three different salts in water.

name of the salt in solution	pH of solution
sodium nitrate	7
ammonium chloride	4
sodium sulphite	10

(a) Which **two** solutions when mixed together could form a neutral solution?

..... and

1 mark

(b) Sodium hydrogensulphate solution behaves like an acid.

(i) Magnesium is added to a solution of sodium hydrogensulphate. What would you expect to see forming on the magnesium?

.....

1 mark

(ii) Sodium carbonate is added to a solution of sodium hydrogensulphate. What gas would you expect to be formed?

.....

1 mark

(c) The formula for a different carbonate compound is K_2CO_3 . Give the names of the **three** elements which make up this compound.

1.

2.

3.

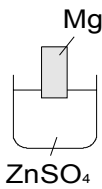
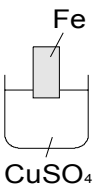
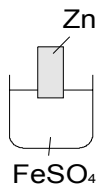
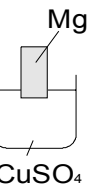
1 mark

Maximum 4 marks

Question 3:

An experiment is carried out to find the relative reactivities of **four** metals: copper, magnesium, iron and zinc.

Strips of **three** of the metals are placed in dilute solutions of different sulphates, as shown below, and left for the same length of time

diagram of experiment				
colour of metal at start	silver coloured	dark grey	light grey	silver coloured
colour of solution at start	colourless	pale blue	pale green	pale blue
appearance of metal at end	light grey	brown		
colour of solution at end	colourless	pale green	colourless	

(a) Use the information in the table to place the **four** metals in order of reactivity.

most reactive

.....

least reactive

.....

1 mark

(b) Use the appropriate descriptions given in the table to help you complete the **three** missing parts of the table.

2 marks

(c) The concentrations of the solutions are the same.

Suggest which of the four experiments gives out the most energy.

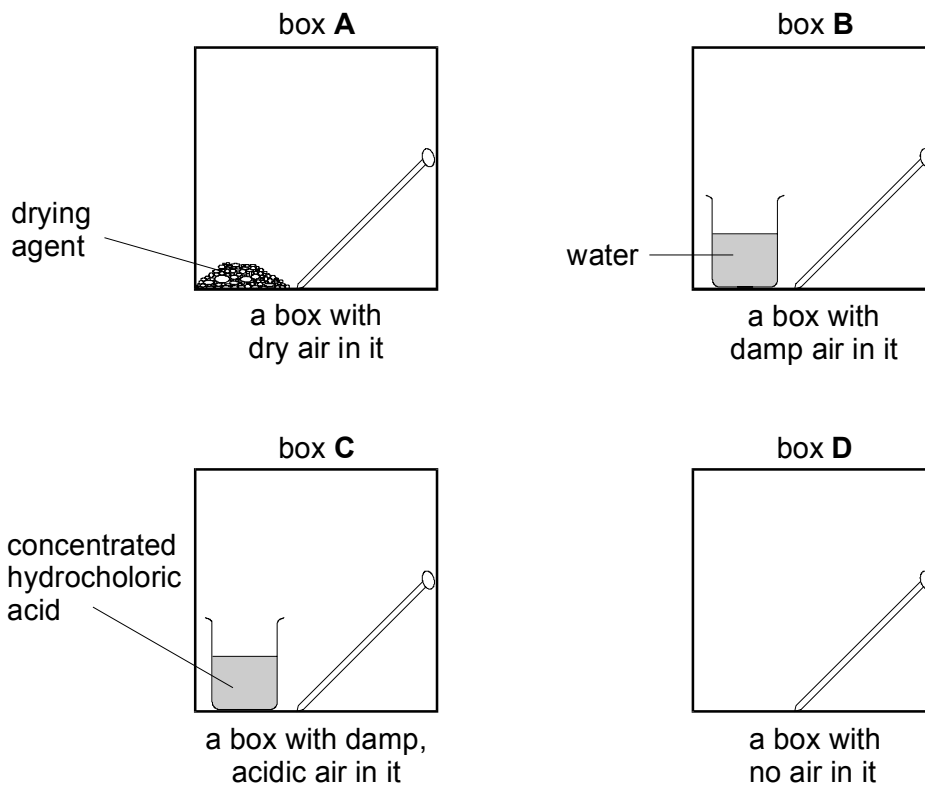
.....

1 mark

Maximum 4 marks

Question 4:

Four shiny iron nails are put in small sealed plastic boxes. The labels show what else is in the boxes.



(a) (i) In which **two** boxes will the iron **not** rust or corrode?

..... and

2 marks

(ii) In which box will the iron corrode the most?

.....

1 mark

(b) Many parts of bicycles are made from iron or steel. These parts can rust easily, even indoors. Give **two** ways to stop these parts rusting.

1.

2.

2 marks

Maximum 5 marks

Question 5:

Rebecca tested four metals to see which would react with solutions of different metal nitrates. The table shows her results.

If the metal reacted she put a tick (✓). If nothing happened she put a cross (x).

metal	magnesium nitrate solution	copper nitrate solution	iron(III) nitrate solution	zinc nitrate solution
magnesium	X	✓	✓	✓
copper	X	X	X	X
iron	X	✓	X	X
zinc	X	✓	✓	X

(a) Rebecca did not know the reactivities of the four metals but, before doing any experiments, she knew where to put **four** crosses in the table.

Put a circle around each of these **four** crosses.

1 mark

(b) Use the information in the table to write down the reactivity series for the **four** metals.

most reactive

.....
.....
.....
.....

Least reactive

.....
.....

1 mark

(c) None of the metals shown in the table reacts with a solution of magnesium nitrate.

(i) Give the name of a metal which will react with a solution of magnesium nitrate.

.....

1 mark

(ii) Give the name of a metal nitrate solution, apart from magnesium nitrate, which will not react with magnesium.

.....

1 mark

Maximum 4 marks