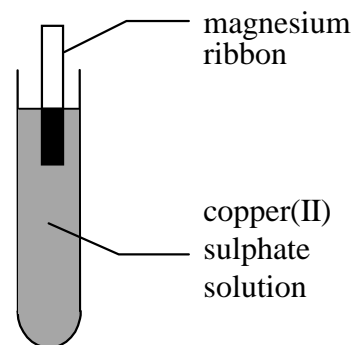


## Reactivity series questions

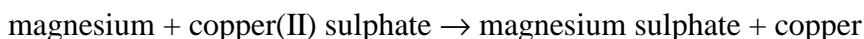
### Displacement reactions

“A more reactive metal will displace a less reactive metal from solutions of its compounds”.

For example, if magnesium is dipped into copper(II) sulphate solution (see diagram on the right), copper is displaced. This is because copper is less reactive than magnesium. You would see a brown or black coating of copper on the magnesium. Solutions containing copper are usually blue, and the blue colour of the copper(II) sulphate solution would fade after a while because colourless magnesium sulphate is being formed instead.



The word equation for this reaction is:



If copper is dipped into magnesium sulphate, there is no reaction because copper is not reactive enough to displace magnesium from the magnesium sulphate solution.

1. For **each** of the following experiments, decide whether a reaction will occur.

If you think there will be no reaction, write down why you think this.

If you think a reaction will happen:

- write down why you think it will happen,
- what you expect to see, and
- the word equation to go with it.

- a) iron into copper(II) sulphate solution  
b) tin into magnesium sulphate solution

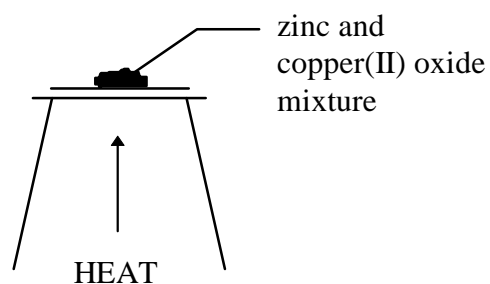
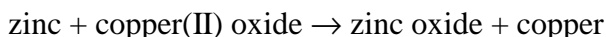
- c) copper dipped into silver nitrate solution  
d) zinc dipped into lead nitrate solution

### Competition reactions

“If a reactive metal is heated with the oxide of a less reactive metal it will remove the oxygen from it”.

For example, if zinc powder is mixed with copper(II) oxide powder, and heated on a tin lid, there is a vigorous exothermic reaction which produces zinc oxide and copper. This is because zinc is more reactive than copper, and so will “steal” the oxygen away from the copper(II) oxide.

The word equation is:



2. For **each** of the following experiments, decide whether a reaction will occur.

If you think there will be no reaction, write down why you think this.

If you think a reaction will happen:

- write down why you think it will happen,
- what you expect to see, and
- the word equation to go with it.

- a) iron heated with copper(II) oxide  
b) aluminium heated with iron oxide

- c) copper heated with iron oxide  
d) magnesium heated with zinc oxide