

1. The table below shows how long it takes 1g of each of the five metals to react completely in hydrochloric acid.

METAL	TIME
copper	years
iron	600s
magnesium	35s
sodium	15s
zinc	180s

1. Write down the metals in order of reactivity (most reactive first).

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

b. Which of these metals react most strongly with water?

c. The reactivity of calcium is mid-way between those sodium and magnesium. How long might 1g of calcium take to dissolve in the acid?

d. Explain why copper rather than magnesium is used to make water pipes. Concentrate on reactivity in your answer.

2. Millions of tonnes of metal are used every year for many different jobs. But they all face one problem. That is corrosion!

a) What does corrosion mean?

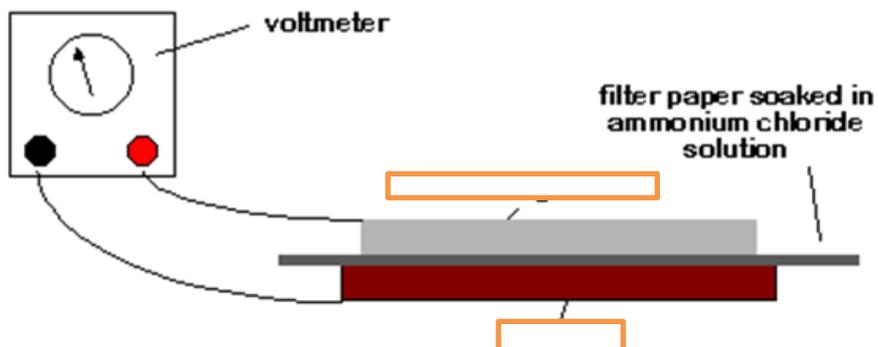
b) The corrosion of Iron is called rusting.

i) What is needed for Iron to rust?

ii) How can the rate of rusting be increased?

c) Chose two methods to prevent Iron from rusting and explain how they work

1. Look at the diagram below



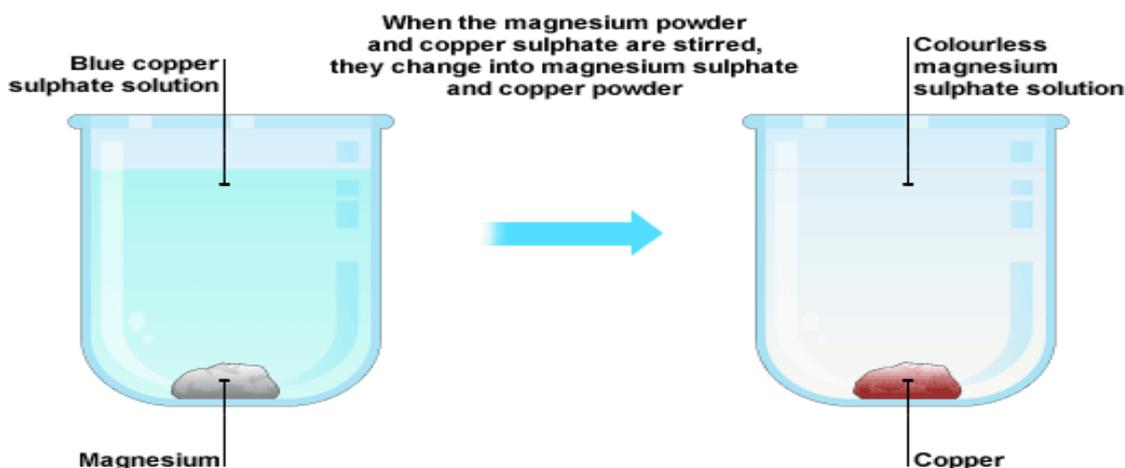
a) From the list below, which two combinations of metals will give the highest voltage.

Gold	Iron
Silver	Copper
Tin	Magnesium

b) If the two metals used were Zinc and Copper, in which direction would the electrons flow?

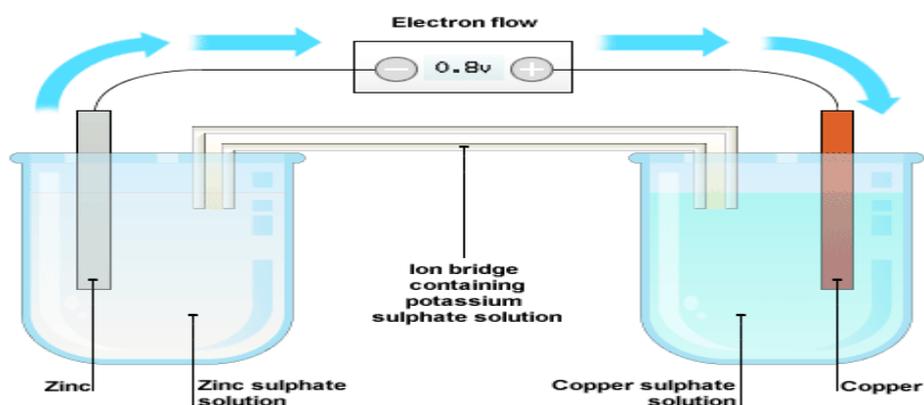
c) What is the purpose of the filter paper soaked in ammonium chloride solution?

2. Look at the reaction below



- Name this chemical reaction
- Write the ion -electron $\frac{1}{2}$ equation for the oxidation reaction
- Write the ion-electron $\frac{1}{2}$ equation for the reduction reaction
- What would be seen if the metal added to copper sulfate solution was a piece of silver?

3. Look at the complex electrochemical cell below



- In which direction will the electrons flow?
- What is the purpose of the ion-bridge?
- Write the ion -electron $\frac{1}{2}$ equation for the oxidation reaction
- Write the ion-electron $\frac{1}{2}$ equation for the reduction reaction