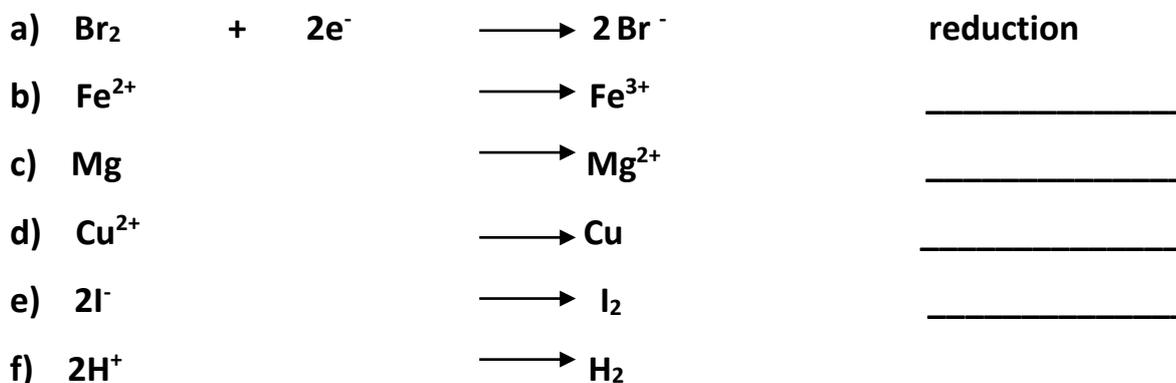


**Practise in writing oxidation and reduction  $\frac{1}{2}$  equations.**

1. Use **page 7 of the data book** to complete the ion-electron  $\frac{1}{2}$  equations below by putting the **electrons** on the correct side and state which are **oxidation** and which are **reduction**. The first one has been done for you.

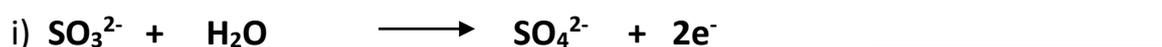


2. In an ion-electron equation, which side are the electrons on?

i) an **oxidation equation** - \_\_\_\_\_ hand side.

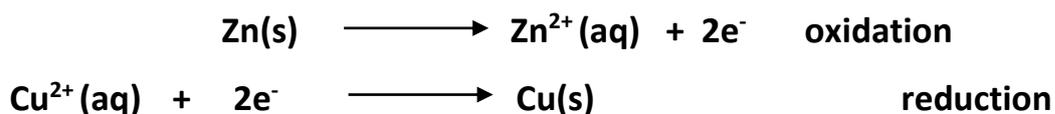
ii) a **reduction equation** - \_\_\_\_\_ hand side.

3. State which of the equations below is an **oxidation** and which shows **reduction**.



## Constructing REDOX equations

Redox equations show both the oxidation and reduction equations together.



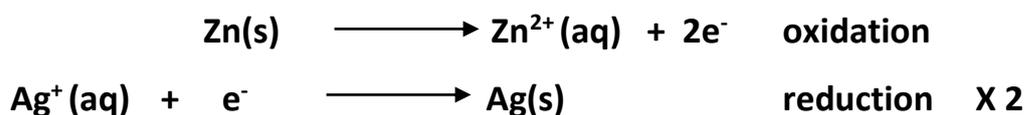
When combining the above equations to form a REDOX equation then the **electrons can be cancelled out** as they will appear on both sides of a combined equation. So the combined **REDOX** equation is:-



The above equation is straightforward because the number of electrons in both ion-electron equations is the same. Some equations are not so easy.

Before you construct a redox equation you must **equalise electrons** and cancel i.e. make sure the **number of electrons are the same** in each of the **reduction and oxidation equations**. To do this you may have to multiply one or both of the  $\frac{1}{2}$  equations by a whole number.

**e.g.1** zinc displacing silver(I) ions from solution to form silver and zinc(II) ions.



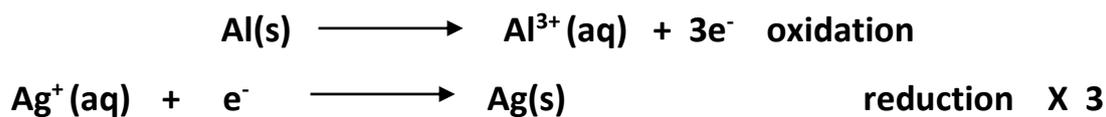
The reduction equation above only has 1 e<sup>-</sup> so the whole equation has to be multiplied by 2 to achieve the same number of electrons as the oxidation  $\frac{1}{2}$  equation.



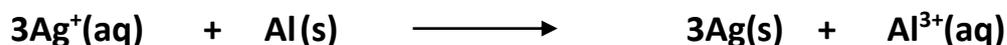
Now we can cancel out the electrons and construct the **REDOX** equation.



e.g.2 aluminium displacing silver(I) ions from solution to form silver and aluminium ions.



REDOX equation:-



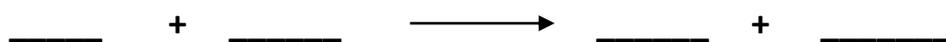
Now try the following examples on your own using page 7 in the data book:-

Remember to **equalise and cancel electrons** before writing the **REDOX** equation.

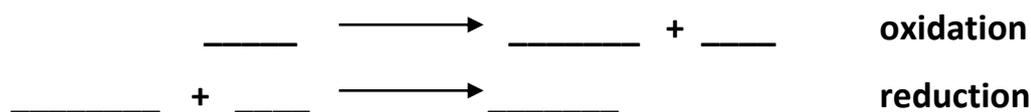
1) magnesium displacing silver(I) ions from solution to form silver and magnesium ions.



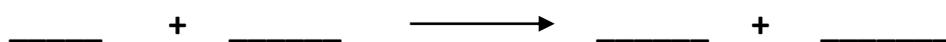
REDOX equation:-



2) aluminium displacing copper(II) ions from solution to form copper and aluminium ions.

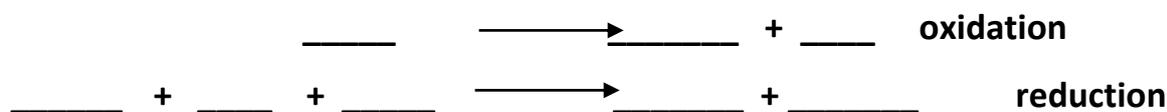


REDOX equation:-



And now for one **without a metal**.

3) permanganate ions ( $\text{MnO}_4^-$ ) reacting with bromide ions ( $\text{Br}^-$ ) to form manganese(II) ( $\text{Mn}^{2+}$ ) ions and bromine ( $\text{Br}_2$ )



REDOX equation:

