**Writing Simple Half Equations**

Half equations show how the electrons were transferred during a redox reaction. One-half equation is written for the substance oxidised and the other for the substance reduced. Many half equations can be written using the following simple steps

For example, when chlorine (Cl2) is bubbled through a potassium bromide (KBr) solution a halogen displacement reaction occurs. The Cl2 replaces the less reactive halogens ions, the Br- ions.

Cl2(g) + 2Br-(aq) 🡪 2Cl- (aq) + Br2(aq)

Step One: Write down on of the reactants, and then write down the product it forms.

Cl2 🡪 Cl-(aq)

Step Two: Balance the number of particles

Cl2(g) 🡪 2Cl-(aq)

Step Three: Balance the charge by adding electrons to one side.

Cl2(g) + 2e- 🡪 2Cl-(aq) (Cl2 reduced, electrons gained)

Step Four: Repeat these first three steps for the other reactant

Br-(aq) 🡪 Br2(aq)

2Br-(aq) 🡪 Br2(aq)

2Br-(aq) 🡪 Br2(aq) + 2e- (Br- ions oxidised , electrons lost)



**What about the K+ ion in the KBr solution?**

The K+ ion is a spectator ion, half equations and redox equations are all net ionic equations where no spectators are included.

If you check to oxidation number of the K+ ion, it is +1 before, and after, indicating the ion does not participate in the redox reaction.