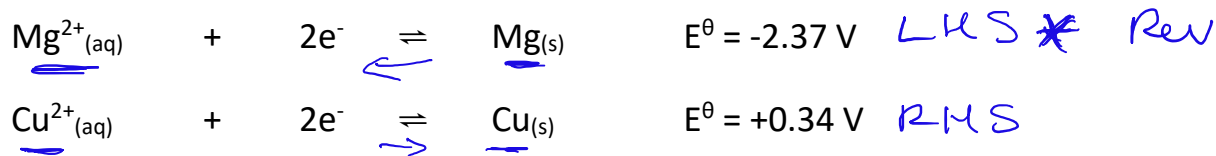


Reaction Feasibility

We can use the equations along with the standard electrode potential values to predict reaction feasibility.

Consider the magnesium, copper cell

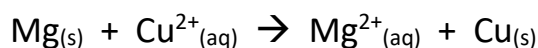


Calculate the standard cell potential for this system

$$+0.34 - -2.37 = +2.71 \text{ V}$$

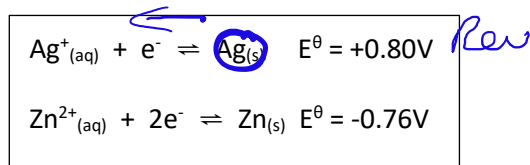
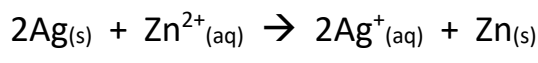
The standard cell potential is positive so the reaction is feasible.

The reaction that is happening is



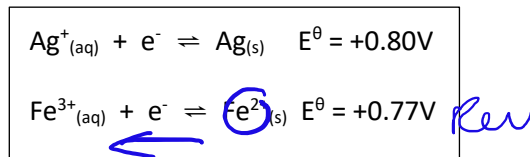
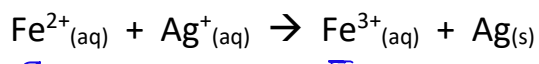
E.g. Will the following reaction occur?

Silver metal reacting with zinc ions



$$-0.76 - 0.80 = \underline{\underline{-1.56 \text{ V}}} \quad \text{not feasible}$$

E.g. Will the following reaction occur?



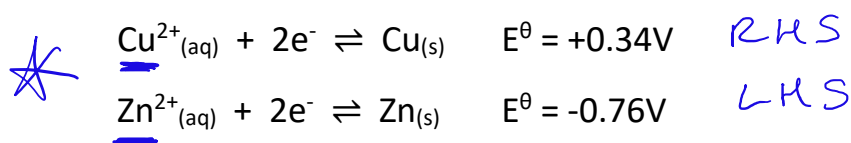
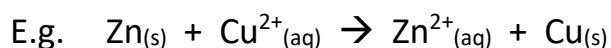
$$+0.80 - 0.77 = \underline{\underline{+0.03 \text{ V}}}$$

feasible

Limitations of this method

1.0M, 298K, 100kPa

Standard cell potentials are calculated under strict conditions. If these conditions are changed we cannot predict reaction feasibility with certainty.



Standard cell potential = $+0.34 - -0.76 = +1.10\text{V}$

The reaction is feasible under standard conditions

However, changing the conditions will shift the position of equilibrium and so change the value of E^θ .

Increasing the concentration of the solutions will shift the equilibrium right making E^θ more positive.

Changing the temperature or pressure of gases will also have an effect on the value of E^θ and so the reaction feasibility.