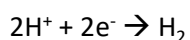


# What is a Standard Electrode Potential?

The simplest electrochemical reaction is one where a proton,  $H^+$  grabs a single electron to form a hydrogen atom. Two of these then form a gas on a surface and bubble away. It doesn't need multiple cations or multiple electrons to reduce a single ion, it doesn't need a particular orientation and it isn't affected by any other electrons in shells.



An electrode doing this reaction is chosen as the "zero point" to measure other metals against

What requirements are needed for a reference potential?

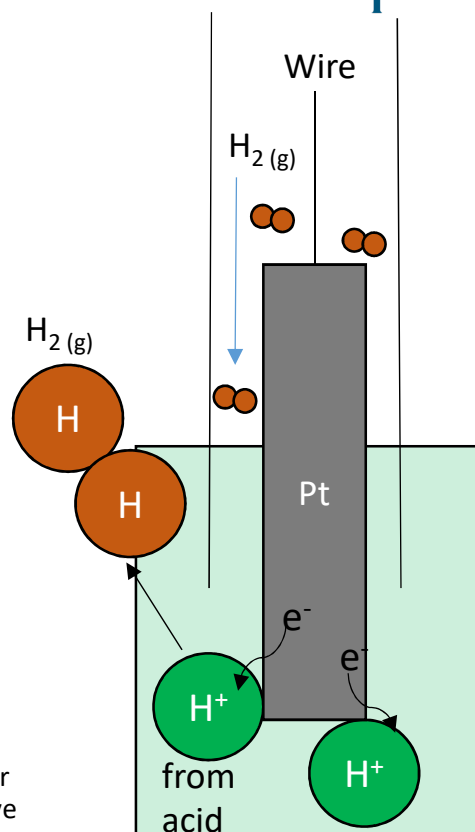
A chemically simple reaction, a stable electrode potential, neither so oxidising or reducing that it is experimentally difficult to achieve

If you had a loads of protons, grabbing electrons from platinum and the hydrogen gas escaping, an **equilibrium** wouldn't be established. So hydrogen is bubbled, at a set pressure, over the platinum electrode, which sits in acid of a set concentration.

This could also work backwards. The bubbling gas could have electrons pulled off it as it passes over the catalyst.

So either protons are being reduced ( $2H^+ + 2e^- \rightarrow H_2$ ) or hydrogen gas is being oxidised ( $H_2 \rightarrow 2H^+ + 2e^-$ ) at the surface of the platinum. The electrons are consumed or provided by a different reaction in another **half cell**.

Potentials are written as reductions, and their values can be found versus the **Standard Hydrogen Electrode**.



What else needs to be kept the same if you wanted to use the Standard Hydrogen Electrode as reference electrode?

