

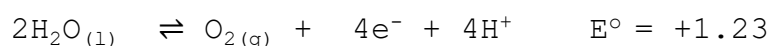
Advanced Case Study: Water Electrolysis

You have managed to split some water with pencils, using the graphite as the electrode.

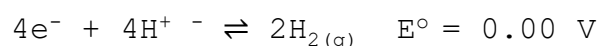
The battery is supplying a current at a voltage determined by the chemistry inside of it. If both oxidation and reduction are happening at the same time in the same container, what will happen to some of the produced H^+ cations and OH^- anions? What impact will this have on efficiency?

What would happen if it was salt water?

Oxidation reaction:

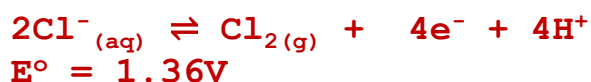


Reduction reaction



But...

Oxidation reaction:



What happens to the Na^+ in this reaction? (Hint, what is left over?)

Although at equilibrium, it would seem oxygen is easier to produce, in actual fact, it is harder to get it to form on the electrode. New electrodes are being researched that will be **selective** for oxygen so sea water can be electrolysed.

It would be useful to be able to produce hydrogen without chlorine which is toxic and corrosive (eg. for transport or to produce ammonia).

<https://phys.org/news/2018-08-closer-sustainable-energy-seawater.html>

