

Electrode Potentials

Pre-lesson assignment – Textbook p. 386-388

Define the following terms

- Voltaic cell
- Half-cell
- Standard electrode potential

Note: You will see that the terms anode and cathode are not present in your textbook. These terms are not required on mark schemes but can be used and will be accepted if correct. However, you should define the anode as the electrode at which oxidation occurs, and the cathode is the electrode at which reduction occurs. This is correct for both electrolysis (- cathode and + anode) and electrochemical cells (+ cathode, - anode).

Make notes on Electrode potentials

1. Describe and sketch an example of a metal ion/metal half-cell.
 - a. Note the convention for writing out a chemical cell. Write out zinc ion/zinc and copper ion/copper half cells, and show an equilibrium equation for each, keeping to the convention for the writing of redox equilibria.
 - b. At what point in the half-cell does the equilibrium occur?
2. Describe and sketch an example of an ion/ion half cell.
 - a. Note that the conventions are the same, and write out the equilibrium for an iron II/iron III half cell.
 - b. Explain why platinum is used as an electrode.
FYI this could be written as $\text{Pt} | \text{Fe}^{2+} \text{Fe}^{3+}$
3. Explain in terms of electrons what happens to each half-cell in a cell when the cell is in operation.
4. Sketch a standard hydrogen electrode and give its electrode potential.
5. Sketch a method of measuring a standard electrode potential
 - a. Explain what a salt bridge is made of.
 - b. Explain what a more negative E^\ominus means in terms of...
 - i. Reduction and oxidation
 - ii. Reactivity
 - c. Explain what a more positive E^\ominus means in terms of...
 - i. Reduction and oxidation
 - ii. Reactivity