

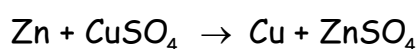
OXIDATION-REDUCTION: PROBLEMS

1. A battery is based on the following pairs: Sn^{2+}/Sn ($E^0 = -0.15 \text{ V}$) and $\text{Fe}^{3+}/\text{Fe}^{2+}$ ($E^0 = +0.78 \text{ V}$).

Draw the battery and indicate with are both half-reactions (oxidation and reduction) and the place in which they take place.

Determine the electromotive force of the battery

2. The overall reaction of a Cu-Zn can be written as follows:

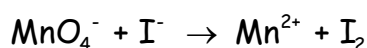


The reduction potentials are Zn^{2+}/Zn ($E^0 = -0.76 \text{ V}$) and Cu^{2+}/Cu ($E^0 = 0.34 \text{ V}$). The current through this battery is 45 mA during 1 hr. Determine:

- the half-reactions in the anode and cathode and the standard electromotive force of the battery
- the amount of copper produced

Atomic weight: Cu = 63.5

3. Consider the following chemical equation:



- balance the equation, using the half-reaction's method
- identify the oxidizing agent and the reductant
- complete the equation, knowing that the ions come from:
 - reactants: potassium permanganate, potassium iodide, sulfuric acid
 - products: manganese sulfate, potassium sulfate, water, iodine
- determine the volume of 0.1 M permanganate solution needed to titrate 5 g of potassium iodide

Atomic weights: K=39; I=127