

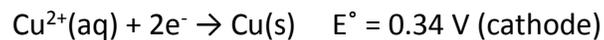
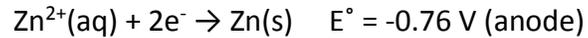
Answer on Question #49800 - Chemistry – Other

Question

Calculate the e.m.f. of a copper-zinc voltaic cell working with the following electrolytes
0.001 M CuSO₄ and M ZnSO₄?

Answer:

The half-cell reactions and standard potentials are:



Calculate the potentials for given concentrations:

$$E = E^{\circ}_{\text{Me}} + (0,059 / z) \cdot \lg [\text{Me}^{z+}]$$

$$E(\text{Zn}) = E^{\circ}_{\text{Zn}} + (0,059 / z) \cdot \lg [\text{Zn}^{z+}] = -0.76 + (0,059 / 2) \cdot \lg [0.001] = -0.849 \text{ V}$$

$$E(\text{Cu}) = E^{\circ}_{\text{Cu}} + (0,059 / z) \cdot \lg [\text{Cu}^{z+}] = 0.34 + (0,059 / 2) \cdot \lg [0.001] = 0.252 \text{ V}$$

The e.m.f is:

$$E^{\circ}(\text{cell}) = E(\text{Cu}) - E(\text{Zn}) = 0.252 - (-0.849) = 1.101 \text{ V}$$

Answer: 1.1 V