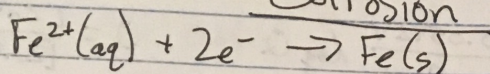
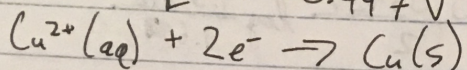


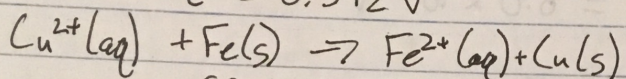
Corrosion



$$E^{\circ} = -0.447 \text{ V}$$



$$E^{\circ} = 0.342 \text{ V}$$



$$E^{\circ} = 0.789 \text{ V}$$

(Fe in contact w/ Cu will oxidize)

Statue of Liberty

corrosion is oxidation
↳ aka rusting

Metal Activity

• E°_{red} must be $< 1.23 \text{ V}$ for corrosion (oxidation of the metal) to occur spontaneously

E°
most negative
(lowest red potential) ↑ most active

$$E^{\circ}_{\text{cell}} = E^{\circ}_{\text{cathode}} - E^{\circ}_{\text{anode}}$$

$$E^{\circ} = 1.23 \text{ V}$$

$$E^{\circ}_{\text{anode}} < 1.23 \text{ V}$$

most positive
(highest red potential) ↓ least active

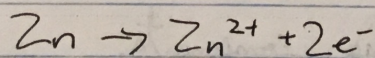
Noble Metals

• Metals with $E^{\circ}_{\text{red}} > 1.23$ are not easily corroded and are referred to as 'noble metals'

Ex: gold, silver, etc.

Preventing corrosion

• coating iron with a metal (Zn) that is more readily oxidized (cathodic protection) prevents corrosion



$$E^{\circ} = -0.76 \text{ V}$$

Fe protected

$$E^{\circ} = -0.44 \text{ V}$$

• Some metals oxidize to form an adherent coating that prevents against further oxidation

