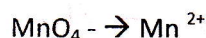
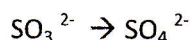
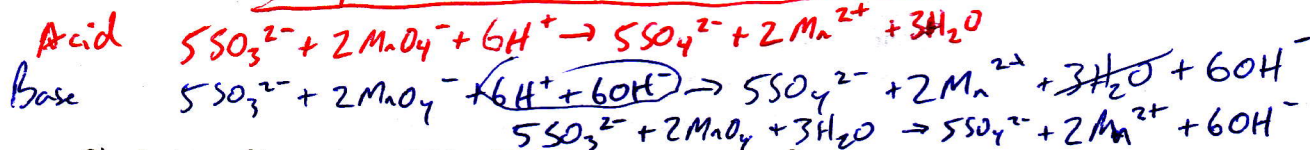
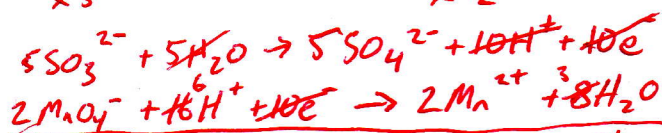
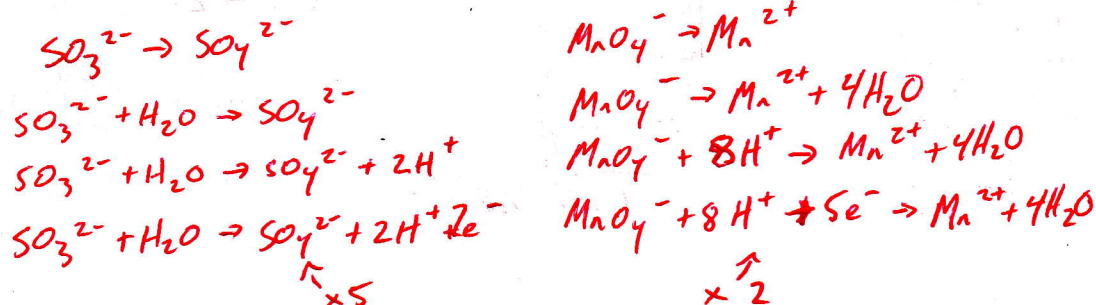


Electrochem review part 1

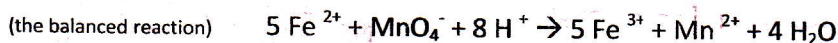
1) Consider the following two reactions:



- Which reaction is the oxidation, and which is the reduction?
- Balance each half reaction and add them together to get the net equation in both acidic and basic solution



- A piece of iron wire weighing 0.21 g is converted to Fe^{2+} and titrated with 22.12 mL of permanganate solution. What is the molarity of the permanganate?



How much Fe^{2+} ?

$$0.21\text{g Fe} \times \frac{1\text{mol Fe}}{55.8\text{g}} \times \frac{1\text{mol Fe}^{2+}}{1\text{mol Fe}} = 0.00376344\text{mol Fe}^{2+}$$

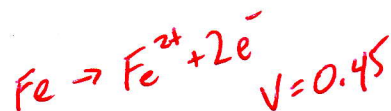
KMnO_4 needed?

$$0.00376344\text{mol Fe}^{2+} \times \frac{1\text{mol MnO}_4^-}{5\text{mol Fe}^{2+}} = 0.000752688\text{mol MnO}_4^-$$

$$\therefore \text{volume delivered} = \frac{0.000752688\text{mol MnO}_4^-}{0.02212\text{L}} = 0.034\frac{\text{mol}}{\text{L}}$$

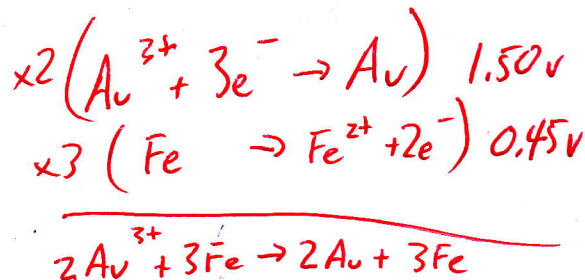
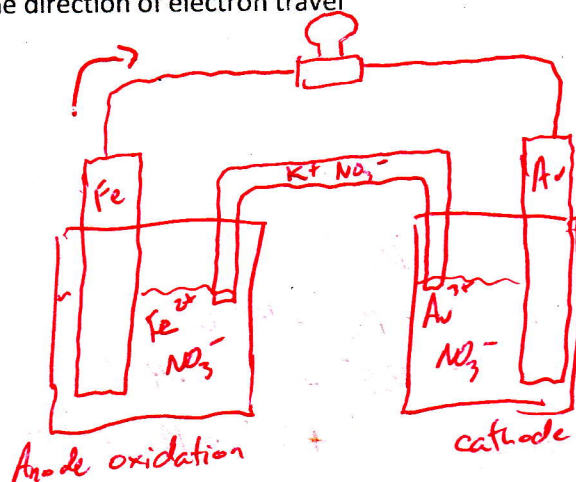


so other electrode
needs to be 0.45V



3) Using solid gold as one of your electrodes, make a 1.95 V electrochemical cell. Your cell must:

- Work ☺
- Have the anode and cathode labeled
- Site of oxidation and reduction shown
- All present ions shown
- The half reactions shown at the correct electrode
- The half reactions added together to show the voltage of the battery
- The direction of electron travel

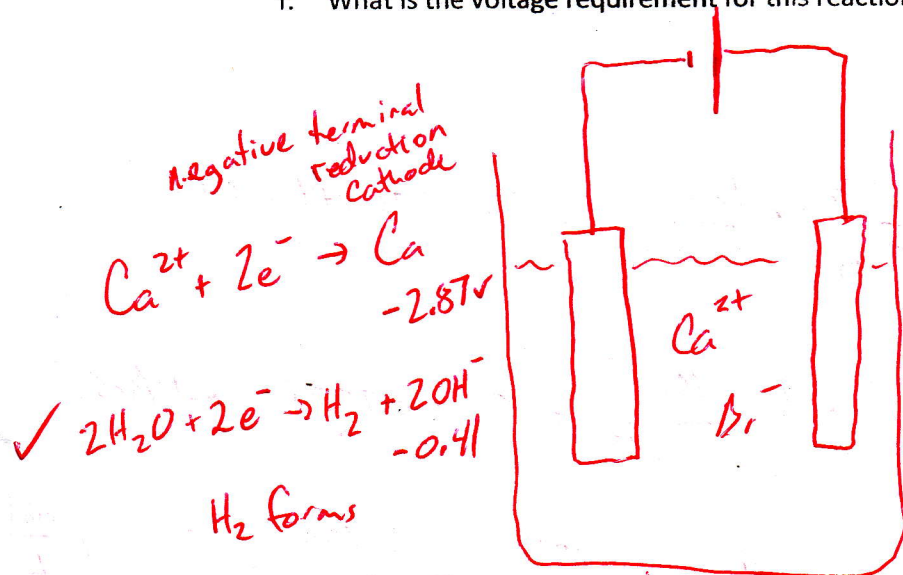


voltage does
not multiply!

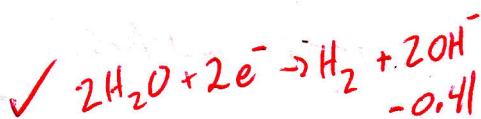
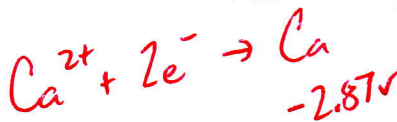
$$1.50 + 0.45 = 1.95\text{V}$$

4) A solution of aqueous Calcium Bromide is placed in an electrolytic cell.

- Draw the cell
- Label the anode and cathode
- Where does reduction and oxidation take place?
- Write all possible reactions that can occur at each electrode
- What products will actually be found at each electrode?
- What is the voltage requirement for this reaction to occur?

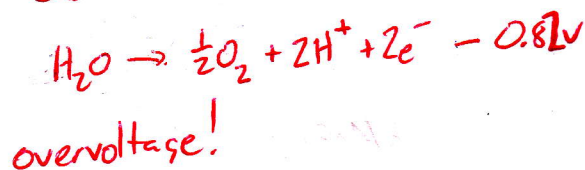
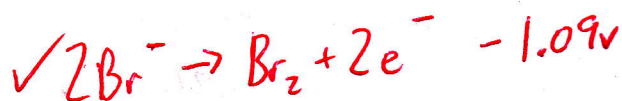


negative terminal
reduction
cathode



H₂ forms

positive terminal
oxidation
anode



Br₂ forms

$$1.09$$

$$+ 0.41$$

1.50 V needed to make work