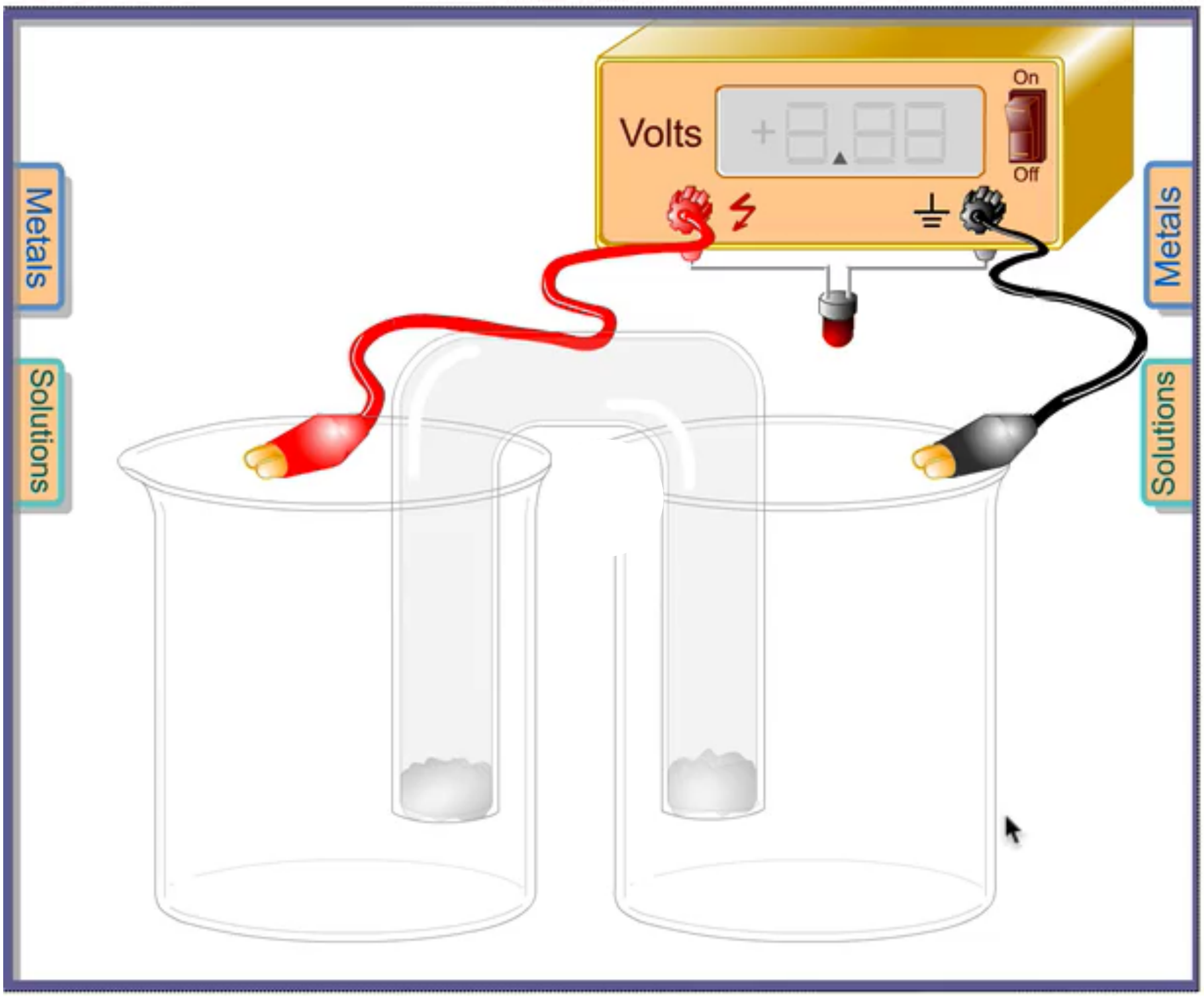
This is BCE#28.

I recommend you print out this page and bring it to class. Click here to show a set of five BCE28 student responses randomly selected from all of the student responses thus far in a new window.

John , here are your responses to the BCE and the Expert's response.

Look at the QuickTime movie below. Play it, and answer the questions that follow based on the movie.



For this BCE you will play movies depicting different electrochemical cell simulation developed by Dr. Greenbowe and his students. Play each movie in turn and record the voltage and write the complete oxidation reduction reaction that occurs.

1. In the first electrochemical cell Zn is the metal in the right-hand beaker (with the black wire) and 1 M $Zn(NO_3)_2$ solution and Cu is the metal in the left-hand beaker (with the red wire) and 1 M $Cu(NO_3)_2$ solution.

cell potential, E°, for the reaction +1.10 volts 88%

E° for the reaction is +1.10 volts

oxidation-reduction reaction Zn(s) + Cu^2+(aq) --> Zn^2+(aq) + Cu(s) 55%

The reaction is Zn(s) + Cu^{2+}(aq) ----> Zn^{2+}(aq) + Cu(s)

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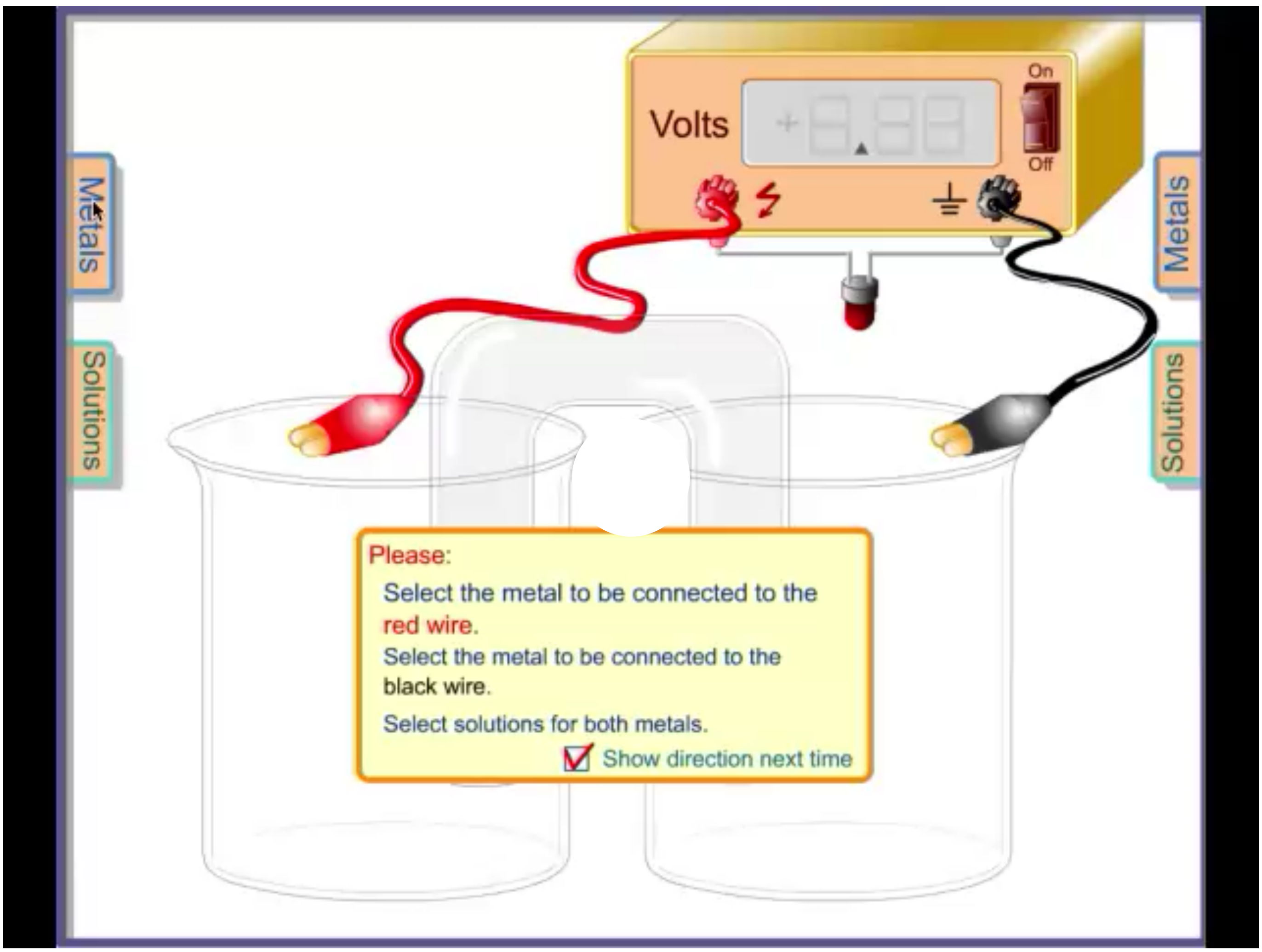


2. The second electrochemical cell uses Zn as the metal in the right-hand beaker (with

the black wire) and 1 M $Zn(NO_3)_2$ solution and a Hydrogen electrode for the left-hand beaker (with the red wire) and 1 M HCl solution. Play the movie and record the voltage and write the complete oxidation-reduction reaction.

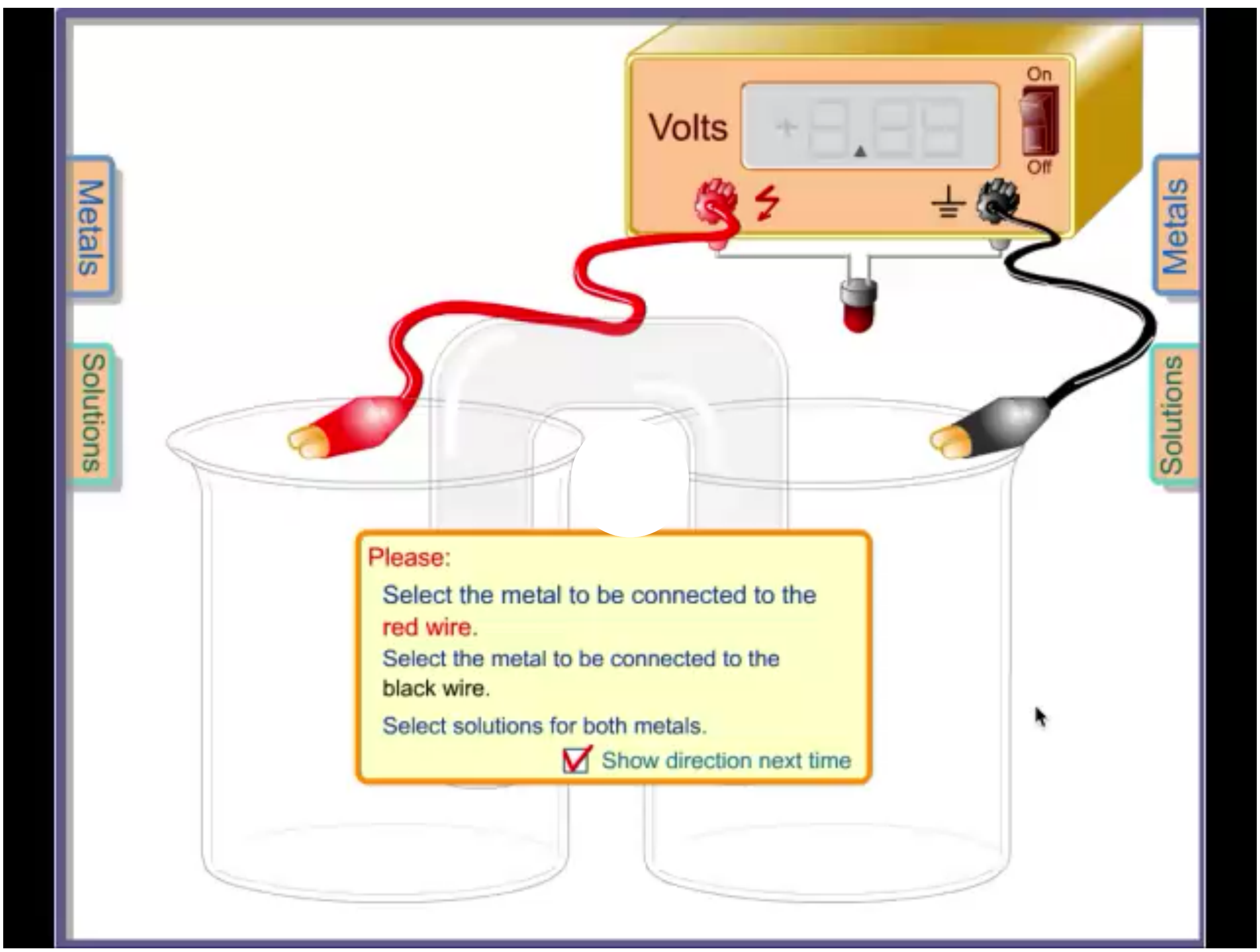
cell potential, E°, for the reaction 0.76 volts 100%

E° for the reaction is +0.76 volts

oxidation-reduction reaction Zn(s) + 2H+(aq) --> Zn^2+(aq) + H2(g) 33%

The reaction is $Zn(s) + 2H^{+}(aq) \longrightarrow Zn^{2+}(aq) + H_2(g)$

Look at the QuickTime movie below. Play it, and answer the questions that follow based on the movie.



3. The third electrochemical cell uses Zn as the metal in the right-hand beaker (with the black wire) and 1 M $Zn(NO_3)_2$ solution and Ag as the metal in the left-hand beaker (with the red wire) and 1 M $AgNO_3$ solution. Play the movie and record the voltage and write the complete oxidation-reduction reaction.

cell potential, E°, for the reaction 1.56 volts 100%

E° for the reaction is +1.56 volts

oxidation-reduction reaction Zn(s) + 2Ag^+(aq) --> Zn^2+(aq) + 2Ag(s) 33%

The reaction is Zn(s) + $2Ag^+$(aq) ----> Zn^{2+}(aq) + 2Ag(s)

4. Which reaction generated the largest/highest voltage? 100%

Zn(s) + 2Ag^+(aq) --> Zn^2+(aq) + 2Ag(s)

The reaction is Zn(s) + $2Ag^+$(aq) ----> Zn^{2+}(aq) + 2Ag(s)

5. If the reaction in Q1 is thermodynamically favored, what can you say about the reverse reaction?

The reverse reaction is not thermodynamically favored. 100%

The reverse reaction will not be thermodynamically favored. So if we added copper metal to a solution of zinc nitrate no reaction would occur. We could get the reaction to occur by adding energy, so if we construct the same cell and we want the reverse reaction to occur we would have to connect a battery source in place of the voltmeter and supply at least 1.10 volts.

6. Is there anything about the questions that you feel you do not understand? List your concerns/questions.

nothing

7. If there is one question you would like to have answered in lecture, what would that question be?

nothing