The Operation of the Voltaic Cell

AKA: A Battery or Galvanic Call

A SPONTANEOUS reaction is a reaction that happens and can produce work! Batteries produce work for us to run our phones, our calculators and our cars, just to name a few things.

To learn about how a battery operates, follow along and take notes

as you watch the video at this address:

<https://www.youtube.com/watch?v=0oSqPDD2rMA>

What is the reaction we are witnessing in this video?

How can we yield useful work from the Zinc and Copper reaction shown in this video?

Why doesn’t the circuit work initially?

What did they add to complete the circuit?

The Copper electrode is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrode and the zinc electrode is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

As the cell reaction proceeds, which electrode loses electrons?

At the same time, what is happening to the copper electrode?

What is happening in the left compartment to the zinc? Oxidation or Reduction?

What do we call this electrode?

What is happening in the copper electrode on the right? Oxidation or Reduction?

What do we call this electrode?

Electrons, in a battery, flow from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In an electrical circuit, how do we maintain electrical neutrality? What name is given to the tube that contains the salt, Na2SO4?

Summary:

The Anode at which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*Tip to remember: Both start with vowels. Oxidation at the Anode!

The Cathode at which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*Tip to remember: Both start with consonants. Reduction at the Cathode!

Electrons flow through the circuit from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*Tip to remember: The current flows alphabetically A to C. Anode to Cathode.

The Salt Bridge has what function?

PRACTICE: Use the knowledge you just acquired to complete the questions below:

The cell below is constructed of copper in a copper (II) sulfate solution and silver in a silver sulfate solution. The electrons of this battery flow from the right cell to the left cell. Copper is being oxidized and silver is being reduced.

1. Use an arrow to show the flow of electrons in the proper direction.
2. What electrode (anode or cathode) is at label #3? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ #5\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. How did you know this?
   2. What process is occurring at #3 (oxidation or reduction)?
   3. What process is occurring at #5?
3. What metal is being used at location #1? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What solution is used at #2? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What metal is the label for #8? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What solution is labeled #6? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What is #9? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_