

KEY

Remote HW #4

Topic: Lemon Battery

1. What is the role of the electrolyte in a cell?

The electrolyte allow conductivity between the anode (+) and the cathode (-)

2. Why is Zinc an anode, and Copper a cathode?

Zinc behaves as the anode (supplying electrons) of the galvanic cell and the copper as the cathode (consuming electrons).

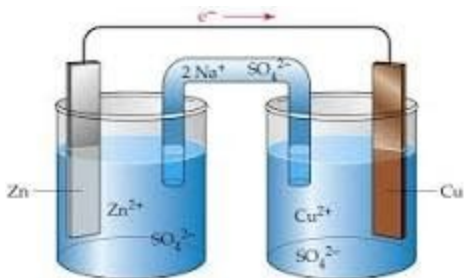
3. Why does the Zinc start dissolving in the electrolyte?

Is it a result of the positive metal ions in a 'sea of electrons' being attracted to the negative ions of the solution making the electrons surrounding them leave, are the electrons repelled by the electrons in the solution or do these electrons 'sense' the copper ions on the other side waiting to be reduced and flows towards them?

4. Why do electrons from the Zinc move to the copper?

So the zinc metal releases electrons when it dissolves, which travel through the wire easily, to the copper.

5. How does the cell create voltage?



Electrochemical cells produce a voltage by making the electrons from a spontaneous reduction-oxidation reaction flow through an external circuit

6. What is electricity?

Electricity is the set of physical phenomena associated with the presence and motion of matter that has a property of electric charge

7. What causes electricity?

Electricity is caused by the flow of electrons within an electric circuit.

8. Write the relationship between force and voltage, if any.

The answer is that when you differentiate the voltage with respect to distance then the result is the force per unit charge.

9. A glass rod becomes positively charged when rubbed with silk. Explain how this happens.

When a glass rod is rubbed with silk, glass happens to lose electrons easily and silk grabs them away from the glass atoms. So after rubbing, the glass becomes positively charged and the silk becomes negatively charged. Thus equal but opposite charge are produced on the both

10. A balloon has acquired a charge of -3.2×10^{-17} coulomb. How many excess electrons does this charge represent? (Use $Q = ne$)

300 excess electrons

11. How many elementary charges are present in 1 coulomb of charge?

6.24×10^{18} elementary charges.