GLOW LIGHTS
AP Chem

Prelab – define these and create a concept map. Remember to use secondary words to tie in the main ideas – refer to: http://www.stanford.edu/dept/SUSE/SEAL/Reports_Papers/Vanides_CM.pdf - page 2 - for help with concept maps)

luminescence, electroluminescence, photoluminescence, chemiluminescence, fluoroescence, phosphorescence, bioluminescence, photon, Planck's constant, speed of light, energy, einstein (the unit), redox, etc.

Purpose: To make your own light by chemiluminescence. You will be making a luminescing solution and an oxidizing solution.

Procedure: Work with everyone at your lab station and split the solutions made between each pair.

Construct an apparatus with clear rubber tubing so that you can pour the solutions through. This may include a ring stand, clamps, funnel, etc. Dissemble at the end of experiment.

1. Mass out 1.00 g of sodium carbonate and put into a 400 mL beaker.
2. Mass out .05 g of luminol and put into the same beaker as #1.
3. Mass out 6 g of sodium bicarbonate and put into the same beaker as #1.
4. Mass out .125 g of ammonium carbonate and put into the same beaker as #1.
5. Mass out .1 g of copper (II) pentahydrate sulfate and put into the same beaker as #1.
6. Mix 250 mL of distilled water into the SAME beaker.
7. Next, dilute 12.5 mL of 3% hydrogen peroxide to 250 mL in another beaker or grad cylinder.
8. Now, divide the solutions in half and share.
9. With the lights off, mix 25 mL of each solution into an Erlenmeyer flask and record observations. Note the time the reaction started and ended.
10. Repeat step 9 until no solution remains.
11. After the lights are back on, observe the ending solution in the flask.

Data:
Observations:

Discussion:
1. What does chemiluminescence relate to electrochemistry?
2. What kind of reaction (endothermic or exothermic) is this experiment?
3. What is the blue color from your glow light from?
4. What does this experiment have to do with a firefly and its ability to possess bioluminescence?
5. What do many deep-sea organisms use this “emission of light” for?
6. What is luciferase?
7. Why can’t the chemical reaction of glow lights be stopped?
8. How does temperature affect the duration of the chemical reaction in glow lights?
9. Why would you use an einstein unit of measurement?

Resources:

Conclusion: