

SALS Activity 7

Luminol

Luminol is a chemical associated with crime scene forensics. When luminol is undergoing oxidation, a bright blue color is emitted; after complete oxidation, the blue color fades. The iron in blood acts as a catalyst, speeding up the reaction between luminol and an added oxidant such as hydrogen peroxide. This makes luminol a handy way to identify blood spatter patterns which can be photographed before the blue luminescence fades away. The goal in this activity is to measure the amount of time it takes for the luminol reaction to go to completion.

Materials

- SALS app downloaded onto iPhone or iPad
- SALS probe
- Luminol
- 3% Hydrogen peroxide
- Potassium ferricyanide
- 1M Sodium hydroxide solution
- Deionized water
- Funnel
- Two 250 mL Erlenmeyer flasks
- One 500 mL Erlenmeyer flask
- Goggles
- Apron
- Gloves
- Pie tin
- Accessible talking timer

Caution

The chemicals used in this activity may cause itching or burning if contact is made with skin. **All students must wear an apron, gloves, and goggles during this activity. If skin is exposed directly to any of the chemicals in this activity, thoroughly wash the affected area with water.**

Directions

1. Teacher instructions prior to activity

- Prepare two separate solutions in the 250 mL Erlenmeyer flasks after marking each flask with large print/braille labels:
 - **Solution 1** contains 0.18 g luminol, 3.0 mL of 1M sodium hydroxide, and 100 mL of deionized water.
 - **Solution 2** contains 1 mL 3% hydrogen peroxide, 0.03g Potassium ferricyanide, and 100 mL of deionized water.

2. Student instructions

- Place the 500mL Erlenmeyer flask on the pie tin and insert the funnel stem into the flask.
- Turn out all room lights, close window blinds/shades, and dim any other possible light sources.
- Carefully pour Solutions 1 and 2 into the funnel at the same time.
- Immediately remove the funnel from the flask and replace it with the SALS probe and start the talking timer.
- Monitor the change in color of the solution based on the emitted SALS tone. The tone should become lower and lower as the light from the reaction fades.
- Stop timing when the tone pitch stops dropping.

Question to answer

How long did it take (in seconds) for the reaction to come to completion (i.e., when light was no longer emitted)?

Resource

"Luminol: The Glowing Reaction." Science Supplies & Curriculum. Carolina Biological.