

Student experiment
(5th - 10th grade)

Mini Traffic Light

🕒 Time: max. 10 min.

Safety:

safety glasses



Instruments:

- 2 flasks (for both solutions)
- 2 pipettes or syringes
- 1 100ml graduated cylinder
- 1 glass with threaded lid
- 1 spatula

Chemicals:

- sodium hydroxide pellets, NaOH (H: 314; P: 280-301+330+331-309-310-305+351+338)
- indigo carmine
- glucose, C₆H₁₂O₆
- water

Preparation:

Two solutions should be prepared.

first solution: sodium hydroxide

1,25 g sodium hydroxide pellets (NaOH) in 100 ml water

second solution: indicator

100mg indigo carmine in 100ml water

Experiment:

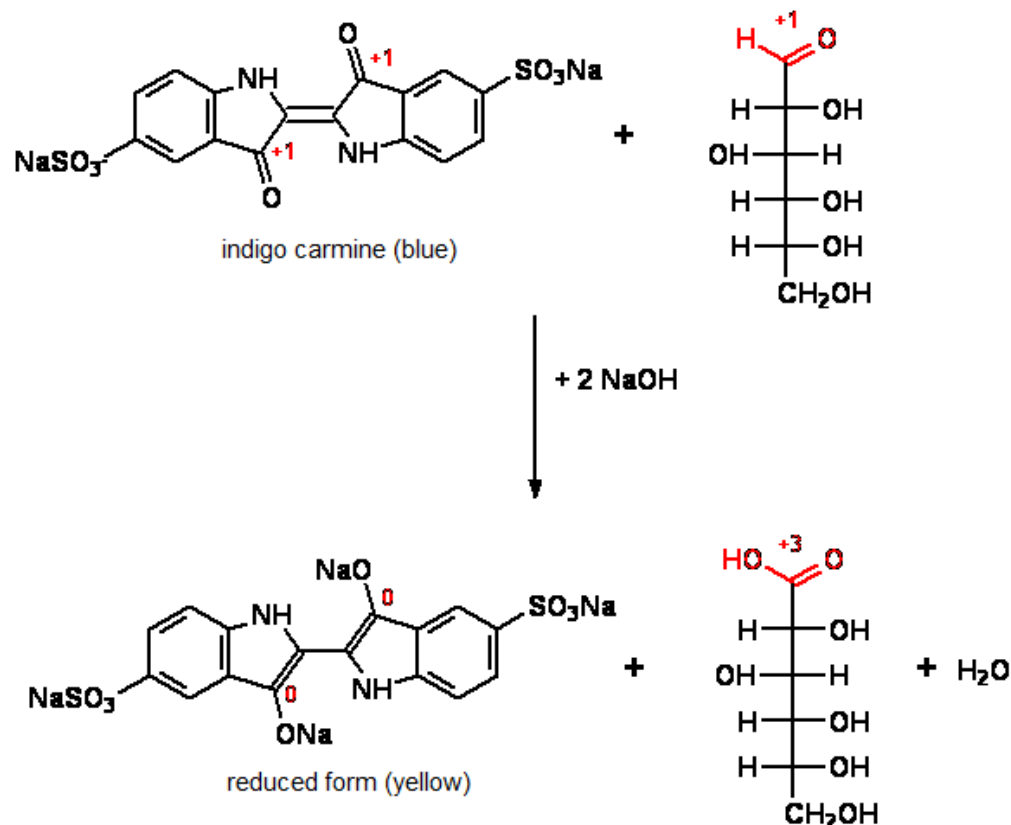
- Place 10 ml of the sodium hydroxide solution (see above) in a glass with a threaded lid.
- Add circa 40-50 drops of the indicator solution to this glass.
- Then add two spatulas of glucose to the mixture.
- After a short time the color will change to green.
- Shake the glass – the solution will turn yellow, then red.
- This sequence can be repeated many times.

Observations:

When the glass is left alone for a short while, a green color is the result. Shaking the glass results first in a yellow color change, then in a red one. The process is repeatable again and again.

Results:

Shaking the mixture results in oxygen from the air entering the solution. This oxidizes the indicator, which first turns yellow (a transitional phase), then red. Leaving the solution alone for a time results in the color returning to green. The glucose is responsible for this, since it reduces the indicator again.

**Disposal:**

The solution should be disposed of in the container for organic solvent waste.

Internet Resource:

Further Information can be found under the following Internet address:
http://www.uni-bayreuth.de/departments/ddchemie/experimente/effekt/video_herbstblatth.htm [last: 15. Juli 2007]