SALS Activity 3
Detecting the effect of dry ice (frozen carbon dioxide) on pH with Bromophenol blue

Materials

- SALS app downloaded on iPhone or iPad
- SALS probe
- Vernier Talking LabQuest
- Vernier pH probe
- Dry ice
- Bromophenol blue pH indicator
- 750 mL beaker
- Medicine dropper, transfer pipette, or notched 1 mL syringe
- Glass or metal stirring rod
- Water
- Insulated gloves
- Hammer
- Pie tin
- Textbooks or sturdy box to create a raised platform
- Safety goggles

Caution

Students must wear safety goggles throughout the entire procedure. Make sure insulated gloves are nearby for handling dry ice.

Directions

1. Fill the 750mL beaker about halfway with water.
2. Add 3 droppers full (or one mL with transfer pipette or syringe) of Bromophenol blue pH indicator to the beaker and stir with the stirring rod.
3. Place the beaker on the pie tin to contain possible spills.
4. If necessary, prepare a raised platform with the books or box on which to rest the Talking LabQuest to facilitate access to the inside of the beaker.
5. Place the SALS probe and the Talking LabQuest pH probe in the beaker close to one side. Take a reading with the SALS probe, save this tone, and begin data collection on the Talking LabQuest.
6. Wearing the insulated gloves, use the hammer to break the dry ice into a block about the size of a fist.
7. With the gloves still on, pick up the piece of dry ice and drop it into the beaker as far away from the sensors as possible. If need be, hold the sensors against one side and tilt the beaker in the opposite direction until the dry ice hits the other side of the beaker. Once this is done, place the beaker flat in the pie tin again.

8. Listen for the tone change in SALS and the pH change announced by the Talking LabQuest to determine when the color of the Bromophenol blue pH indicator changed.

Questions to answer

1. At what pH do you think the color changed?

2. Does bromophenol blue indicate a solution becoming more acidic or more basic?

3. What effect did adding dry ice to the water have?