Water to Wine (Water to Wine to Beer to Milk)

Purpose

To demonstrate concentration differences between acids and bases through color changes and precipitate formation and to explain the solution process of simple ionic and covalent compounds using visual, particulate representations.

Materials

4 display glasses	Sat. $NaHCO_3$ solution
Phenolphthalein	Sat. $BaCl_2$
Bromothymol Blue	6M H_2SO_4

Procedure

Preparation

1. Fill the first display glass (#1) with 25 mL of saturated sodium bicarbonate. Fill display glass with water until it is ¾ full.
2. Add 20 drops of the phenolphthalein indicator into the second display glass (#2).
3. Add 10 mL of 6M sulfuric acid to the third display glass (#3) right before starting the demo. Then add 16 drops of the bromothymol blue indicator to the glass. Swirl contents.
4. Add 10 mL of saturated barium chloride to the fourth display glass (#4).

Demonstration

1. Hold up display glass #1 with the "water".
    a. Tell the students that you are thirsty and will have a glass of water after a long day (if applicable), but that you're not sure if water is what you really want right now. Tell them that maybe you feel more like having a glass of wine.
2. Pour the contents from display glass #1 into display glass #2 and the solution will tum red and hence the "wine" solution.
    a. Say "Now that's better, but maybe I'm more in the mood for a refreshing beer".
3. Pour the contents from display glass #2 into display glass #3 and the solution will tum yellowish and bubbles will form creating a "head" of foam on the "beer". Make sure to not pour too fast or the solution could bubble over.
    a. Say "Ah, this is great, but maybe I've had a little too much to drink so I should drink something healthier... like milk (as you perform step 4)".

4. Pour the contents from display glass #3 into display glass #4 and the solution will turn white. The white precipitate, BaC03, makes this solution seem like "milk".
    a. Say "Now this is perfect"

Safety

Solutions can be collected in a properly labelled waste container with UI# 202525.

Disposal

The "Milk" solution should be placed in a properly labeled waste container. All other solutions can be poured down the drain with excess water.