

16.3 Acid breath

Subjects: Acids/bases, titrations

Description: The instructor breathes into a flask containing a colored solution. After several breaths, the color of the solution will change.

Materials:

250 mL Erlenmeyer flask with stopper to fit

Disposable pipets

~50 mL water

~10 drops Universal indicator solution[‡]

Saturated sodium bicarbonate (if needed)[‡]

[‡]Saturated bicarbonate solution is located on the solutions shelf. Universal indicator is located in the flammables cabinet.

Pre-class preparation:

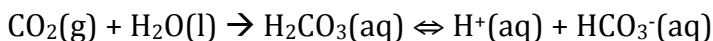
1. Add water and the Universal indicator to the flask.
2. Add 1 drop of saturated sodium bicarbonate solution to produce a slightly basic solution blue/green in color.
3. Stopper the flask until you're ready to perform the demo.

Procedure:

1. Unstopper the flask
2. Breathe into the flask several times. Swirl the flask between breaths.
3. The solution will turn orange/yellow after approximately 10 breaths due to a decrease in pH.

Discussion:

After several breaths, there will be enough CO₂ dissolved in the solution to produce enough carbonic acid to cause a decrease in the pH of the solution. The equation for the reaction is given below. The decrease in pH produces a color change of the indicator.



Safety: None

Disposal: Solutions can be flushed down the drain with water.

References:

1. L. Summerlin; C. Borgford; J. Ealy. *Chemical Demonstrations: A Sourcebook for Teachers*; Volume 1; 1985; p. 40