Bologna Salt Bridge

Recommended for Chapter(s): 11

Demo #033

Materials NOT in box

1. Safety goggles
2. Bologna (get from freezer in demo room).
3. Document camera (the document camera is on the bottom shelf of the shelving on your right as you come into the demonstration room next to demo # 049).

Procedure

1. (Prep) Sand the zinc and copper strips if needed.
2. (Prep) Set up document camera so students can read voltage on volt meter.
3. (Prep) Place the Cu strip in one of the 150 mL beakers and add ~120 mL of 1.0 M $Cu(NO_3)_2$.
4. (Prep) Place the Zn strip in the other 150 mL beaker and add ~120 mL of l.0 M $Zn(NO_3)_2$.
5. (Prep) Hook the red end of the voltmeter to the copper and hook the black end of the voltmeter to the zinc.
6. Soak a piece of paper towel in the KNO_3 solution and drape it between the two beakers. The volt meter should now read ~1 V.
7. Replace the salt bridge with a strip of bologna. The volt meter should read approximately the same value.

Safety

1. Wear safety goggles

Cleanup

1. Pour waste into waste bottle.
2. Return the materials to the cart in the demonstration library room.

Stockroom Notes

1. Throw away bologna.
2. Pour waste into lab waste beaker. These are the same solutions used in the electrochemistry lab.
3. Replace glassware with clean glassware.
4. If needed refill any materials that have been used up.
5. Return items to demonstration tub.
6. Return tub to the demonstration library.
    a. Return goggles to goggle tub.
    b. The document camera goes on the bottom shelf of the shelving on your right as you come into the demonstration room next to demo # 049.

Discussion

This demo can be used to make several points. On the simplest level the demo can be used to show that the salt bridge does not need to be made out of any special material. As long as ions are present it can act as a salt bridge. The ions present in bologna are the salt (Na^+ and Cl^-) ions.

On a deeper level, students can predict what voltage the cell will produce given the standard potentials.

$Zn^{2+} + 2e^- \rightarrow Zn$ $\quad E° = -0.76V$

$Cu^{2+} + 2e^- \rightarrow Cu$ $\quad E° = 0.34\ V$

Therefore, the cell would be predicted to produce 1.10 V.

The voltmeter will most likely read slightly lower than the calculated value. This is usually due to oxides on the metal electrodes. To improve the performance, sand the electrodes prior to use.

Materials for demo 033

1. One M $Zn(NO_3)_2$
2. One M $Cu(NO_3)_2$
3. One 1 M KNO_3
4. Two 150 mL Beakers
5. Volt meter
6. Tweezers
7. Copper strip
8. Zinc strip
9. Waste bottle
10. Sandpaper