



7. Repeat this process for the other three flasks.
8. For flasks 3-5, the reaction will result in an overflow of liquid into the balloon. After the most vigorous portion of the reaction, gently hold up the balloon and allow the contents to drain back into the reaction flask.

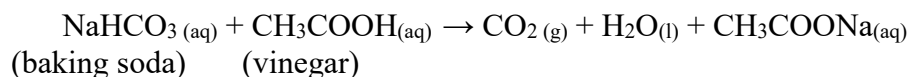
### **Alternate**

This demo can be performed using Mg and HCl in place of vinegar/baking soda, however the HCl can bubble over into the balloon, forming holes in the latex and causing the acid to spill out.

### **Discussion**

This demonstration can be used to illustrate the concept of limiting reagents.

When vinegar (a dilute solution of acetic acid: CH<sub>3</sub>COOH) and baking soda (NaHCO<sub>3</sub>) react, carbon dioxide, a gas, is produced:



In the first two flasks the limiting reagent is the baking soda, so as you add more baking soda the balloon gets bigger. The third flask contains a 1:1 molar ratio of vinegar and baking soda. In the fourth and fifth flasks the limiting reagent is now the vinegar, so the balloons remain the size as the balloon on the third flask.

### **Disposal**

All solutions can be poured down the drain with excess water and balloons can be thrown away.

### **Reference**

Dr. Feldwinn Demo Library, UCSB:

<http://www.chem.ucsb.edu/~feldwinn/DemoLibrary/DemoPDFs/Demo010.pdf>