

CBC Demo Lab Digest



To order for Autumn 2024, Please click here :)

or scan the QR Code:



Today is Friday, August 23rd.

... Kick off the semester with one of these fun demonstrations!!

Use the [link](#) (Password: hydrogen) to order as well as the full list of demos; as always, early orders are very appreciated!

General Chemistry I

Weekly topics

- Matter and Measurement

Matter and Measurement

$2\text{H}_2 : 1\text{O}_2$ Balloon

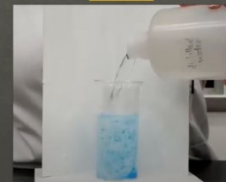


H_2/O_2 Balloon – Ignite a balloon filled with a stoichiometric mixture of hydrogen and oxygen to show the extremely exothermic (and loud) reaction that produces water.

Changes of State



Heterogeneous vs. Homogeneous Mixtures



Changes of State – Pour liquid nitrogen into a beaker to demonstrate a variety of physical changes: the boiling of N_2 (l), the deposition of H_2O (g) as H_2O (s) on the outside of the beaker, and the melting of H_2O (s) to H_2O (l) as the beaker eventually warms up again

Heterogeneous and Homogeneous Mixtures – Add solid NaCl to solid

CuSO_4 in a beaker and stir – this is a heterogeneous mixture. Add water to the beaker and stir – a homogeneous mixture (a solution) results.

General Chemistry II

Weekly topics

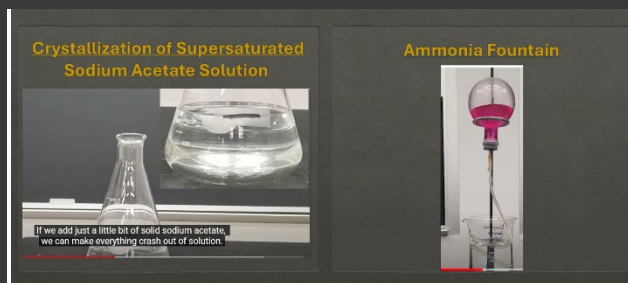
- Properties of Solutions

Properties of Solutions



Sugar and Salt – Use two conductivity testers with light bulbs to contrast the conductivity of $\text{d-H}_2\text{O}$, sugar solution, and NaCl (aq) .

Strong and Weak Acids and Bases – Use two conductivity testers with light bulbs to contrast the conductivity of weak and strong electrolytes: acetic acid and HCl (aq) , and/or $\text{NH}_3 \text{ (aq)}$ and NaOH (aq) .



Crystallization of Supersaturated Sodium Acetate Solution – Add a tiny crystal of sodium acetate to a 2 L flask of a super-saturated solution to cause the solid to crystallize out, leaving almost no liquid – this demonstration is beautiful and dramatic, as well as being quite exothermic. Alternatively, you can pour the solution slowly over a single crystal to build up a column of solid sodium acetate.

Ammonia Fountain – Show the solubility of $\text{NH}_3 \text{ (g)}$ in H_2O due to hydrogen-bonding. Alternative: Luminol Ammonia Fountain

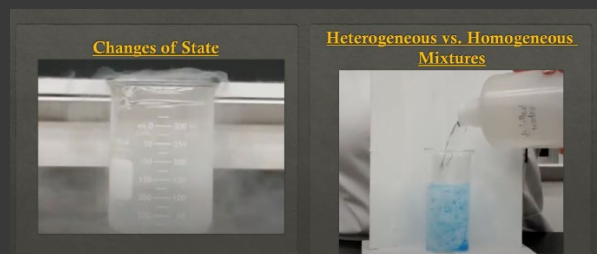
Elementary Chemistry

Weekly topics

- Matter and Measurement

Matter and Measurement

H_2O_2 Balloon – Ignite a balloon filled with a stoichiometric mixture of hydrogen and oxygen to show the extremely exothermic (and loud) reaction that produces water.



Changes of State – Pour liquid nitrogen into a beaker to demonstrate a variety of physical changes: the boiling of $\text{N}_2 \text{ (l)}$,

the deposition of $\text{H}_2\text{O}(\text{g})$ as $\text{H}_2\text{O}(\text{s})$ on the outside of the beaker, and the melting of $\text{H}_2\text{O}(\text{s})$ to $\text{H}_2\text{O}(\text{l})$ as the beaker eventually warms up again.

Heterogeneous and Homogeneous Mixtures – Add solid NaCl to solid CuSO_4 in a beaker and stir – this is a heterogeneous mixture. Add water to the beaker and stir – a homogeneous mixture (a solution) results.

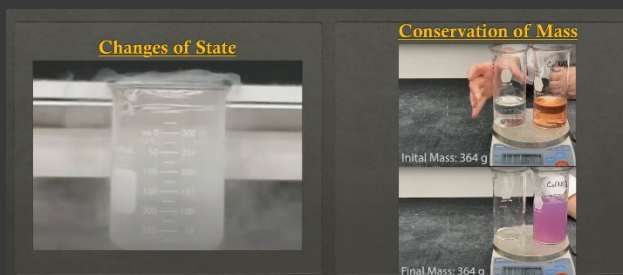
General Chemistry for Engineers

Weekly topics

- Introduction to Chemistry

Introduction to Chemistry

H₂O₂ Balloon – Ignite a balloon filled with a stoichiometric mixture of hydrogen and oxygen to show the extremely exothermic (and loud) reaction that produces water.



Changes of State – Pour liquid nitrogen into a beaker to demonstrate a variety of physical changes: the boiling of $\text{N}_2(\text{l})$, the deposition of $\text{H}_2\text{O}(\text{g})$ as $\text{H}_2\text{O}(\text{s})$ on the outside of the beaker, and the melting of $\text{H}_2\text{O}(\text{s})$ to $\text{H}_2\text{O}(\text{l})$ as the beaker eventually warms up again.

Conservation of Mass – Demonstrate the law of conservation of mass with the colorful reaction of $\text{Co}(\text{NO}_3)_2(\text{aq})$ and $\text{Na}_2\text{CO}_3(\text{aq})$, using the document camera to project the digital readout of a balance on the screen before and after the reaction.

Foundations of General Chemistry

Weekly topics

- Chemical Reactions and Chemical Quantities

Chemical Reactions and Chemical Quantities

Acid-Base Titration – Add 1 M $\text{NaOH}(\text{aq})$ to a solution of 0.1 M HCl and phenolphthalein to show the endpoint.



Avogadro's Law – Three flasks containing equal amounts of acetic acid are fitted with balloons containing different amounts of NaHCO_3 . Mix the reagents by lifting and shaking the balloons, starting the reaction. The balloons will inflate with CO_2 to a volume proportional to the number of moles produced, in accordance with Avogadro's law.

Combustion of Candy – Contrast the rate of oxidation of sucrose in the body

(by eating some candy) with the oxidation of sucrose by KClO_3 (as shown by dropping some candy into molten KClO_3) producing steam and a lavender flame. The body temperature is $\sim 37^\circ\text{C}$, and the melting point of KClO_3 is 368°C .

Have a great week!



-The Demo Lab

P.S. If you are ahead/behind of schedule, let us know so we can adjust the demos accordingly. Currently we are simply using the syllabi to guess where your respective classes are at. And [here is the link again](#)