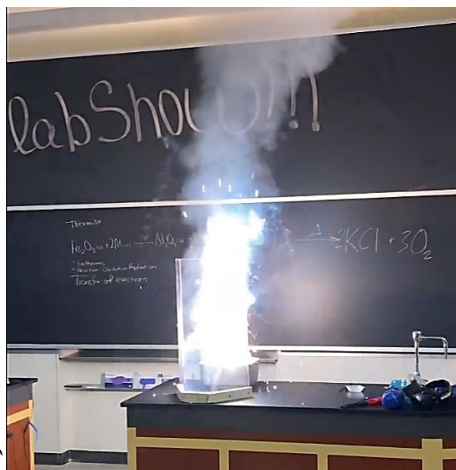


CBC Demo Lab Digest



More outreach fun: Today we hosted show #2 of 2: Our friends from the Ohio Supercomputer Center-Summer Institute visited us for a 1-hr Long show full of Fun Demos! Above is a picture of our Thermite reaction demo, and Student Assistant, Sean, performing fireworks balloons- Magnesium.

To order for Summer 2024, Please click [here](#) :)

or scan the QR Code:



Today is Friday, June 14th

... And these are the trendiest demonstrations for the upcoming week!

We are currently re-organizing our lab now chemicals, models, and all equipment alike are just as confused of their location as we are ... so while they are still (somewhere) on our shelves, order while you can!

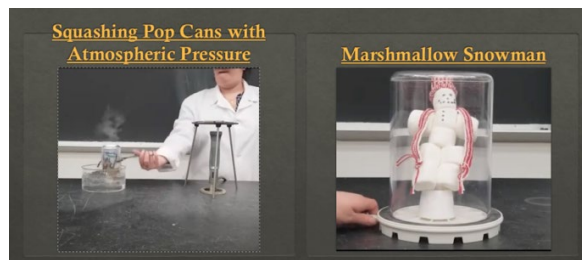
Use the [link](#) (Password: hydrogen) to order as well as the full list of demos; as always, early orders are very appreciated!

General Chemistry I

Weekly topics

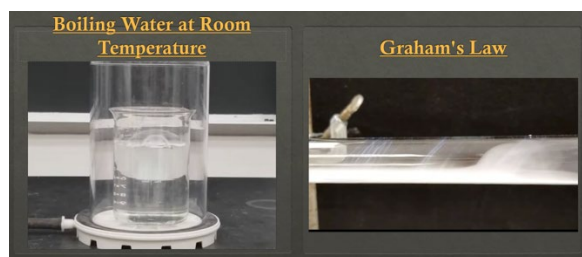
- Gases

Gases



Squashing Pop Cans with Atmospheric Pressure – use atmospheric pressure to squash pop cans

Marshmallow Snowman – Demonstrate the effect a decrease in P has on V by placing a marshmallow snowman in a bell jar and then evacuate the jar.



Boiling Water at Room Temperature – Show water boiling at room temperature in a beaker in an evacuated bell jar, then put your hand in the water after boiling to convince students of its low temperature. (Upon request, we can give you a clean beaker and tap water if you want to drink the boiled water)

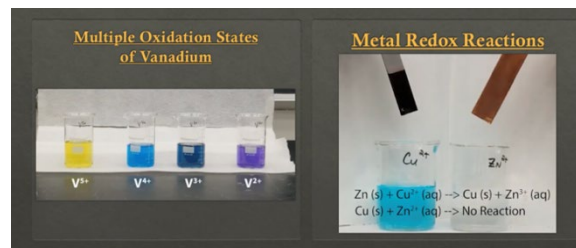
Graham's Law – Allow concentrated NH_3 and concentrated HCl to vaporize and meet in a horizontal glass tube, forming a ring of NH_4Cl

General Chemistry II

Weekly topics

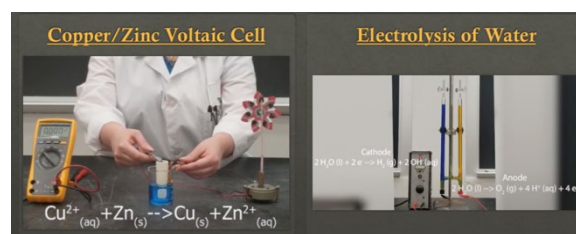
- Electrochemistry
- Transition Metals and Coordination Chemistry

Electrochemistry



Multiple Oxidation States of Vanadium – Shake a solution of ammonium meta-vanadate with a Zn-Hg amalgam to reduce the vanadium from +5 to +4 to +3 to +2 with different colors at each stage.

Metal Redox Reactions – Compare redox reactions between metals and metal ions to see which is spontaneous.



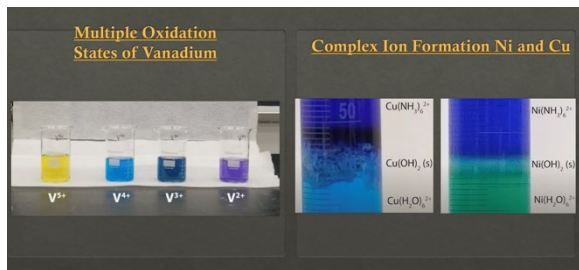
Copper/Zinc Voltaic Cell – Demonstrate a copper/zinc voltaic cell turning a motor to show that a spontaneous reaction can be harnessed to do work.

- Pass around a disassembled 9 V battery to show that it is comprised of six 1.5 V cells.

Electrolysis of Water – Electrolyze water (dilute Na_2SO_4 solution with indicator) in the Hoffman apparatus to decompose it into its component

elements, hydrogen and oxygen. If desired, you can test the $\text{H}_2(\text{g})$ and/or $\text{O}_2(\text{g})$ produced with a flame and a glowing splint, respectively.

Transition Metals and Coordination Chemistry

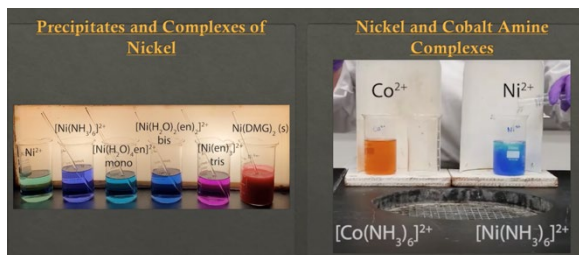


Multiple Oxidation States of Vanadium - (Also listed under Electrochemistry to the left) - Shake a solution of ammonium meta-vanadate with a Zn-Hg amalgam to reduce the vanadium from +5 to +4 to +3 to +2 with different colors at each stage.

Complex Ion Formation Ni and Cu –

Show color change associated with formation of complex ions. In a tall graduated cylinder of Cu^{2+} or Ni^{2+} aqueous solutions, carefully add 6 M NH_3 to create a layering effect of $[\text{M}(\text{H}_2\text{O})_6]^{2+} / \text{M}(\text{OH})_2 / [\text{M}(\text{NH}_3)_4]^{2+}$

- CuSO_4 gives a blue / white / dark blue layering
- $\text{Ni}(\text{NO}_3)_2$ gives a green / white / dark blue layering



Precipitates and Complexes of Nickel –

Add different amounts of ethylenediamine to beakers of Ni^{2+} to contrast the colors of $\text{Ni}(\text{H}_2\text{O})_6^{2+}$ and the Ni^{2+} chelate complexes with one, two, and three ethylenediamine molecules.

Nickel and Cobalt Ammine Complexes –

show the dependence of color on both the metal ion and its oxidation state. Add concentrated ammonia to Ni^{2+} and Co^{2+} solutions to show different colors with the same ligand. Next, shake some of the resulting $[\text{Co}(\text{NH}_3)_6]^{2+}$ complex with O_2 to shift the oxidation state from Co^{2+} to Co^{3+} , to show different colors with different oxidation states.

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](#)