Chemistry of Organic Compounds—Demonstration Summaries and Concepts

Cleaning with Charcoal—Turning Grape Juice into Water!

Miracle action! Wonder cleaning! No, it's not a TV commercial for a new cleaning product. It's activated charcoal, which has been used for thousands of years to remove contaminants from water and make it safe to drink. Demonstrate the uses of activated charcoal in both water treatment plants and products for the home by turning grape juice into water.

Concepts

- Activated charcoal
- Adsorption
- Water treatment

The Carbon Soufflé—Removing Water from Sugar!

Sugar is the main ingredient in this "chemical" soufflé. Sugars are carbohydrates—carbon plus water. Sulfuric acid, a powerful dehydrating agent, will dramatically remove the water from sugar, leaving only carbon behind. The exothermic reaction produces a great column of carbon that bubbles and grows out of the reaction beaker. This is a terrific demonstration to show the amount of chemical energy stored in food.

- Carbohydrates
- Dehydration reaction
- Exothermic reaction

Feeling Blue—Organic Redox Reaction

Banish the blues from your chemistry classroom! The reaction of a reducing sugar with an organic redox indicator shows us how the blues may come and go when things get a little shaken up. This classic demonstration will help students develop good observation and reasoning skills. What causes the blue color to disappear and then reappear again? How long does it take for the blue color to disappear? What conditions will affect how fast the blue color dissipates?

- Oxidation–reduction
- Reducing sugar
- Redox indicator

Kaleidoscope . . . Optical Activity—Rotation of Plane Polarized Light

The existence of chiral compounds is a unique feature of natural products and the chemistry of life. Discover the interesting properties of "optically active" compounds using only polarizing films and a beaker of corn syrup on an overhead projector. When plane polarized light passes through a solution containing only one "handed" isomer of a chiral compound, the solution "rotates" the plane of polarized light. Optical rotation produces a kaleidoscope when many different colors of plane polarized light are used.

- Chiral compounds
- Enantiomers
- Optical activity
- Plane polarized light

Salt-Out the Red, the White, and Blue—Making a Three-Layer Liquid

Create a beautiful three-layered liquid to demonstrate the salting-out effect and the relative density and miscibility of different solvents. The three liquid layers consist of toluene, methyl alcohol, and water. Methyl alcohol is "salted out" and separated from water by adding potassium carbonate. The water is dyed blue with copper(II) sulfate, and toluene is colored red with Sudan III. Why don't the methyl alcohol and toluene mix?

- Miscible and immiscible liquids
- Salting-out effect
- Density

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