



GREEN CHEMISTRY PRODUCTS



Innovating Science introduces a new line of green chemistry products to help your students learn about the issues and technologies in the news today.

The Production of Biodiesel

In this activity, students will be performing a two-phase process to produce small batches of crude biodiesel. The crude biodiesel produced is of sufficient quality for use in the demonstration of the burning qualities of both biodiesel and vegetable oil. Included is an optional small-scale exercise where the students will use a washing procedure for the crude biodiesel if you wish to have the students experience the full process of producing biodiesel to meet quality levels necessary for use in vehicles.

Kit Includes:

- 4 X 500ml Vegetable oil
- 15 X 25ml Methyl alcohol
- 1 X 20g Potassium hydroxide
- 2 Microburners

Optional: Containers with sealable caps large enough to hold 200ml of liquid (if performing the washing process)
Distilled water (if performing the washing process)

S97621 \$75.65



Electrochemical Remediation of Wastewater

Water pollution is one of the largest threats facing the global population. Water is a finite resource. Once polluted, it cannot be set aside in the hopes that the environment will "make" new, clean water. One procedure often employed to treat wastewater is coagulation/flocculation. While the coagulation/flocculation procedure in wastewater treatment is effective, it involves the addition of chemical components to the water being treated. Recently, a great deal of attention has been given to less traditional alternatives to the typical process of coagulation/flocculation. One such approach receiving good deal of attention is a process called electrocoagulation. Electrocoagulation is a coagulation process carried out by an electrical charge. Contains enough materials for 15 groups of students.

Kit Includes:

- 30 Aluminum electrodes
- 15 Red connectors w/alligator clips
- 15 Black connectors w/alligator clips
- 1 bt. Sodium sulfate, 15g
- 1 bt. 0.1% crystal violet, 15ml

Optional: Funnels, Filter paper

S97622 \$65.85



Detergents and the Environment

Understand the consequences of cultural nutrient overloading on the aquatic environment. Recognize that there may be alternative, more environmentally-friendly alternatives in typical consumer chemical goods. Demonstrate and monitor the effects of two detergent builders on natural water samples. Visually quantify the differences between phosphate and non-phosphate detergent builders on aquatic organisms. There are enough materials for 15 groups. Teacher's manual and student copymasters are included.

Kit Includes:

1	Phosphate builder (10% sodium phosphate) solution, 50ml
1	Non-phosphate builder (10% sodium silicate/5% citric acid) solution, 50ml
1	Control (deionized) water, 50ml
45	Plastic cups
1 box	Microscope slides
1 box	Coverslips

Optional: Microscopes, Plastic wrap or similar

S96401

\$42.50



A Greener Synthesis of Acetylsalicylic Acid

Show students it is possible to produce sodium salicylate acid from a naturally-occurring, renewable resource. Students will convert sodium salicylate to salicylic acid, collect and dry prepared salicylic acid. They may then use a quick confirmatory test to examine for the presence of salicylic acid. The prepared salicylic acid can then be used to synthesize acetylsalicylic acid. There are enough materials for 15 groups. Teacher's manual and student copymasters are included.

Kit Includes:

6	Sodium Hydroxide 3M, 25mL
6	Hydrochloric Acid 3M, 25mL
1	Methyl Salicylate, 25mL
2	Acetic Anhydride, 25ml
1	Phosphoric Acid 85%, 5mL
1	Ferric Nitrate, 5ml
15	Pipettes, Disposable

S96402

\$54.90



Determining the Composition of an Unknown Mixture

Often times, the composition of a mixture may contain a variety of unknown components. In some cases, the components of a mixture may be known but the exact amount of those components in the mixture is not. Analytical chemists often have a variety of tools and techniques to analyze unknown substances and arrive at conclusions with regards to the compounds/percentages in the mixture. In this activity, students will determine the percent composition of sodium carbonate and sodium bicarbonate in an unknown sample. The mixture is heated vigorously until the sodium bicarbonate is completely decomposed to sodium carbonate. The only other products of the reaction are carbon dioxide and water. After performing the necessary calculations, students will determine the percentage of sodium bicarbonate that was present in their original sample. There are enough materials for 15 groups. Teacher's manual and student copymasters are included.

Kit Includes:

- 1 Sodium carbonate, 200g
- 1 Sodium bicarbonate, 200g
- 5 Pre-labeled bottles (to prepare unknowns)

S96404

\$35.55



An Alternative Iodine Clock Reaction

Students will learn the mechanisms and reactions involved in one type of clock reaction and understand how a clock reaction may provide insight into reaction kinetics. After assembling, performing, and obtaining data from several clock reactions students will alter experimental conditions and investigate the effects on clock reaction data. Determination of both the effects of both concentration and temperature on chemical kinetics will be investigated. There are enough materials for 15 groups. Teacher's manual and student copymasters are included.

Kit Includes:

- 3 X 100ml Ascorbic Acid 1.7%
- 3 X 100ml IKI Dilute Lugol's Solution
- 2 X 200ml Hydrogen Peroxide 3%
- 1 X 3g Starch, Soluble
- 30 Plastic Cups
- 30 Stir Sticks
- 60 Measuring Cups, Disposable
- 60 Pipettes, Disposable

S96403

\$41.65



Green Nanochemistry: Synthesis of Silver Nanoparticles

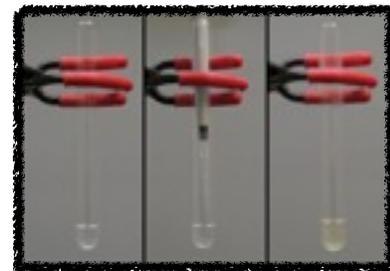
Nanotechnology is a field of technology that is described as the control and manipulation of matter in the 1 to 100 nanometer (nm) range. A nanometer is one billionth of a meter, or one millionth of a millimeter. To put it in perspective, an average sheet of copier paper is about 100,000 nanometers thick so a nanometer is 100,000th the thickness of a piece of copier paper. Certain materials, when prepared at nanoscale levels, display different physical and chemical properties than those of the same materials prepared on a larger scale. In this activity, students synthesize silver nanoparticles from silver nitrate. The particles are synthesized in glucose and starch, as opposed to the more hazardous reagents typically employed. There are enough materials for 15 groups. Teacher's manual and student copymasters are included.

Kit Includes:

- 1 0.1M Silver nitrate, 1ml
- 1 0.1M Glucose, 5 ml
- 1 Soluble starch (to make 50ml of 0.2% solution)

S96405

\$51.95



The Hydrogen Fuel Cell Demonstration

In this demonstration, energy will be produced from combining of hydrogen and oxygen to form water. Platinum will serve as the catalyst and electrodes will be prepared by coating metal mesh with platinum. The hydrogen and oxygen will come from electrolysis. After the cell is set up, a brief current is applied (with a 9-volt battery) causing the formation of hydrogen gas bubbles on one electrode and oxygen gas bubbles on the other. Using a voltmeter, electricity produced by the recombining of hydrogen and oxygen, facilitated by the platinum metal catalyst, can be observed. Contains enough materials for 5 demos.

Kit Includes:

- 15 Brass metal mesh squares
- 2 Red connecting wires w/alligator clips
- 2 Black connecting wires w/alligator clips
- 2 D-cell battery holder w/clips
- Chloroplatinic acid 0.05M, 25ml
- Glass rod

S96400

\$38.15



Innovating Science by Aldon

“cutting edge science for the classroom”

Check out our newest Green item:

Green Fuel Cell Kit using Neulog® sensors

Monitor voltage generated by a green fuel cell that is powered by yeast. Uses Neulog® brand sensors.

S02153
\$49.95

