

## Introduction

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### Lab Options

AP Chemistry requires the completion of hands-on lab activities, and has been approved by the College Board as meeting all requirements for a laboratory science course.

To conduct the hands-on laboratory activities in this course, you will need to obtain the materials listed in this document. Apex Learning has partnered with a third-party vendor to create a custom laboratory kit that contains all the materials needed for this course. The kit may be purchased via Apex Learning or directly from the vendor's website at <http://www.qualitysciencelabs.com/apex-learning-science-kits/>. Once there, select the "[Advanced MicroChem Kit for Apex Learning](#)."

### Lab Manual

There is no lab manual for this course. It is strongly recommended that students keep a detailed notebook of their work as some colleges require proof of experiments.

See the [Course Materials List](#) for required textbooks.

### Disclaimer

Apex Learning® has no liability whatsoever regarding any hands-on laboratory activities. The personnel at the school at which the student conducts the hands-on lab activities, or the student's parent or guardian if the lab activities are completed at home, are responsible for all such hands-on lab activities, including ensuring that qualified personnel are available to supervise the activities.

### Questions

Contact Apex Learning Support by phone at 1-800-453-1454 or by email at [support@apexlearning.com](mailto:support@apexlearning.com).

## Hands-On Lab Materials

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\*Items not included in the lab kit

### Gravimetric Analysis

Semester 1: 1.1.8

- Glass stir rod
- Plastic beaker, 150 mL
- Magnesium sulfate,  $MgSO_4$
- Glass beaker, 50 mL
- Large white coffee filters (4)
- Plastic beaker, 30 mL
- Rubber band
- Funnel
- Plastic cup, 12 oz.
- Digital balance
- Plant food\*

- Distilled water\*
- Paper towels\*
- Plates\* (2)
- Household ammonia\*,  $NH_4OH$  (Normal and lemon scent types will work.)

## Mole Ratios

Semester 1: 1.2.8

- M Calcium nitrate,  $Ca(NO_3)_2$
- M Copper nitrate,  $Cu(NO_3)_2$
- M Potassium iodide,  $KI$
- M Sodium oxalate,  $Na_2C_2O_4$
- Reaction plate, 96-well
- Plastic toothpicks
- Small beaker
- Distilled water \*

## Redox Titration

(Semester 1: 2.1.8)

- 0.010 M  $KMnO_4$  solution in a sealed vial
- Digital balance
- Washing bottle
- 2 graduated pipettes
- 50 mL glass beaker
- 15 mL, 30 mL, 150 mL beakers
- 0.1 M HCl
- Plastic funnel
- Clear disposable cups\*
- Baking soda\*
- Disposable plate\*
- Distilled water\*
- Antiseptic Hydrogen peroxide 3% (fresh bottle)\*

## Electrochemistry: Galvanic Cells

Semester 1: 2.2.8

- Reagents:
  - M copper nitrate,  $Cu(NO_3)_2$
  - M nickel nitrate,  $Ni(NO_3)_2$
  - M zinc nitrate,  $Zn(NO_3)_2$
  - M sodium acetate,  $CH_3COONa$
- 24-well reaction plate

- Chromatography paper
- Small beaker
- Fine sandpaper
- Plastic toothpicks
- Digital voltmeter with alligator clips
- Copper metal
- Nickel metal
- Zinc metal

### Enthalpy of Fusion of Ice

- Semester 1: 3.1.8 Digital balance
- Digital thermometer
- Tongs
- Polystyrene foam cover for cups
- Beaker, 150 mL
- Tap water (cold and hot)\*
- Paper towels\*
- 8 oz. polystyrene foam cups (2)\*
- Ice cubes\*

### Enthalpy of Reaction

Semester 1: 3.1.9

- Measuring spoon, 1 cc
- Steel wool
- Polystyrene foam cover for cups
- Graduated cylinder, 10 mL
- Digital thermometer
- Plastic beaker, 15 mL
- Plastic beaker, 30 mL
- Stopwatch
- Plastic beaker, 150 mL
- Tape\* or rubber band
- Baking soda (sodium hydrogen carbonate)\*
- Vinegar (ethanoic acid/acetic acid)\*
- 8 oz. Polystyrene foam cups (2) \*

### Investigation Colorimetry: Light Path and Concentration

- Semester 1: 4.1.8 Test tubes, 12×75 mm (2)
- Note cards, 3×5 inch
- Plastic beaker, 150 mL
- Plastic cups (5) (Coffee cups will work.)

- Digital scale
- Glass beaker, 50 mL
- Gatorade@ or Pepsi Blue, and Bug Juice@\*
- A sheet of white paper and a lamp\*
- Blue food dye\*
- Transparent tape\*

## Types of Compounds

Semester 1: 4.2.8

- Digital balance
- Conductivity apparatus and 9 volt battery
- Ascorbic acid solid in vial
- Palmitic acid solid in vial
- Paraffin
- Washing bottle
- Small spatula
- Graduated pipette
- Wire gauze
- 12 x 75 mm test tube
- Distilled water\*
- Sucrose (sugar crystals)\*
- Sodium chloride (salt)\*
- Aluminum foil\*
- Pencil or pencil "lead"\*
- Paper towel\*
- Wax paper or plasticwrap\*
- Heat source\*

## Paper Chromatography

Semester 2: 1.1.8

- Chromatography paper
- Glass beaker, 50 mL
- Plastic beaker, 150 mL
- 96-well reaction plate
- Copper nitrate 0.1 M,  $\text{Cu}(\text{NO}_3)_2$
- Potassium iodide 0.1 M, KI
- Cotton swab
- Mixed food coloring solution
- Fine tip pipets
- Bromophenol blue
- Black felt-tip pen, wet erase

- Glycerin or Mineral oil\*
- Isopropyl alcohol (90-99%)\*
- Scissors\*
- Tape or stapler\*
- Pencil\*
- Distilled water\*
- Other dark-colored water-soluble materials such as: other felt-tip pens, food coloring, fruit juice, vegetable juice, etc.\*

## Types of Chemical Reactions: Evidence for Chemical Changes

### Semester 2: 1.2.8

- Reagents:
  - M Acetic Acid ( $\text{HC}_2\text{H}_3\text{O}_2$ )
  - M calcium nitrate,  $\text{Ca}(\text{NO}_3)_2$
  - M copper(II) nitrate,  $\text{Cu}(\text{NO}_3)_2$
  - M nickel(II) nitrate,  $\text{Ni}(\text{NO}_3)_2$
  - M zinc nitrate,  $\text{Zn}(\text{NO}_3)_2$
  - M potassium iodide, KI
  - M potassium hydroxide, KOH
  - M sodium oxalate,  $\text{Na}_2\text{C}_2\text{O}_4$
  - M sodium sulfate,  $\text{Na}_2\text{SO}_4$
- 96 well reaction plate
- 24-well reaction plate
- Plastic toothpicks
- 150 mL plastic beaker
- Digital Balance
- Weighing boat
- 0-6 pH paper
- Baking soda ( $\text{NaHCO}_3$ )\*

## The Effects of Temperature and Particle Size

- Semester 2: 2.1.8 Digital thermometer
- Beaker, 150 mL
- Tongs
- Alka-Seltzer® tablets (5)\*
- Ice cubes\*
- Tap water, hot and cold\*
- Timer/stopwatch\*
- Plastic cups (2)\*

## Analyzing Concentration vs. Time Data

### Semester 2: 2.2.8

- Reagents:
  - M hydrochloric acid, HCl
  - M sodium thiosulfate,  $\text{Na}_2\text{S}_2\text{O}_3$
- 96-well reaction plate
- Plastic toothpicks
- Small beaker
- Distilled water
- Stopwatch or a watch with a second hand
- White paper

## Reversible Reactions

Semester 2: 3.1.8

- M Hydrochloric acid
- 24-well reaction plate
- M Sodium Hydroxide
- Plastic toothpick
- Bromophenol blue indicator
- Distilled water\*
- Solubility Equilibrium
- Semester 2: 3.2.8
- M calcium nitrate,  $\text{Ca}(\text{NO}_3)_2$
- M sodium oxalate,  $\text{Na}_2\text{C}_2\text{O}_4$
- 96-well reaction plate
- Fine-tip pipet
- Plastic toothpick
- A sheet of black or dark paper\*

## Acid-Base Titration

Semester 2: 4.1.8

- M sodium hydroxide, NaOH
- M acetic acid,  $\text{CH}_3\text{COOH}$
- 15 mL beaker
- All ranges of pH paper with 0.5 pH precision

## A Buffer Solution

Semester 2: 4.2.8

- Reagents:
  - M acetic acid,  $\text{CH}_3\text{COOH}$
  - M sodium acetate,  $\text{CH}_3\text{COONa}$
  - M hydrochloric acid, HCl

- M sodium hydroxide, NaOH
- Bromophenol blue indicator, pH range: 3.0 yellow to 4.6 purple
- Phenolphthalein indicator paper, pH range: 8.3 colorless to 10.0 red
- 96-well reaction plate
- Plastic toothpicks
- Universal indicator paper
- Distilled water\*