Introduction

Lab Options

This course includes the option of hands-on or dry lab activities.

- Dry labs require the lab manual – no additional materials are required.
- Hands-on labs require the lab manual and the materials listed below.

Lab Manual

Prentice Hall Chemistry Lab Manual, Student ed. Antony Wilbraham, Dennis Staley, Michael Matta, and Edward Waterman (Prentice Hall, 2005).

- See the Course Materials List for how to acquire this manual and for additional optional materials.

Hazardous Materials

Proper lab safety equipment should be worn at all times. Additionally, some of the materials contained in these labs may be dangerous if misused. Refer to the Material Safety Data Sheets (MSDS) for all materials before completing the labs. These lists may be obtained through the chemical supplier or online at the Physical and Theoretical Chemistry Laboratory, Oxford University: Chemical and Other Safety Information http://msds.chem.ox.ac.uk/.

Additional precautions are contained in the instruction materials for particular laboratory activities. The lab supervisor must be familiar with the MSDS and with the precautions detailed in the course. Students must take care to verify that they are working with the correct chemicals before conducting any experiments.

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.

Hands-On Lab Materials

Observing and Inferring

Semester 1: 1.3 / PH: Experiment 1

- 2 insulated gloves
- Crucible tongs
- Safety goggles and apron
- 3 watch glasses
- 3 100-mL beakers
- 4 glass stirring rods
- (3) 250-mL beakers
- Plastic wash bottle
- Manganese (IV) oxide (t)
- 3% Hydrogen Peroxide
- Wood splints
- 2-L graduated cylinder
- Ice
- 0.05*M* silver nitrate (c)(t)
- Distilled water
- Calcium ethanoate
- 95% ethanol (f)(f)
- Universal indicator solution
- 0.1*M* sodium hydroxide (c)(t)
- Dry ice (c)
- Cornstarch
- Copper wire

Mass, Volume, and Density

Semester 1: 2.4 / PH: Experiment 4

- Safety goggles
- Centigram balance
- 25-mL graduated cylinder
- Ruler
- Metal samples
- Paper towels

Periodic Properties

Semester 1:3.4 / PH: Experiment 9

- Safety goggles and apron
- Centigram balance
- 100-mL graduated cylinder
- Tin (Sn)
- Lead (Pb) shot (t)
- Silicon (Si)
- Distilled water

Precipitation Reactions

Semester 1: 4.4 / PH: Experiment 17

- Safety goggles
- Glass stirring rod
- Plastic wash bottle

- Distilled water
- Spot plate or 15 small test tubes
- Set 1 (see lab manual for chemicals)
- Set 2 (see lab manual for chemicals)
- Set 3 (see lab manual for chemicals)

Oxidation-Reduction Reactions

(Semester 1: 5.4.3; PH: Experiment 46)

- Safety goggles
- Glass-marking pencil
- 9 small test tubes
- 10mL graduated cylinder
- Test-tube rack
- Plastic wash bottle
- 3 strips of copper, Cu, each 0.25 mm x 0.50 cm x 2.00 cm
- 3 strips of lead,
- Pb, each 0.25 mm x 0.50 cm x
- 2.00 cm
- 3 strips of zinc,
- Zn, each 0.25 mm x 0.50 cm x
- 2.00 cm
- Steel wool
- 0.1M copper (II) nitrate, Cu(NO3)2 (toxic)

Freezing Point

Semester 2: 1.4 / PH: Experiment 33

- Safety goggles
- Centigram balance
- Spatula
- Large test tube
- Ring stand and utility clamp
- Thermometer
- Copper wire stirrer
- 3pronged jaw clamp
- Gas burner
- Timer with second hand
- Benzoic acid, C6H5COOH (toxic) (irritant) (flammable)
- One of the following solutes:
    - Camphor, C10H16O (toxic) (irritant) (flammable)
    - Urea, CO(NH2)2 (toxic) (corrosive) (irritant)
    - Potassium ethanoate, CH3COOK (irritant)

Disturbing Equilibrium

Semester 2: 2.4 / PH: Experiment 38

- 0.1M iron (III) chloride, FeCl3 (toxic) (irritant) (corrosive)
- 0.1M potassium thiocyanate, KSCN (toxic)
- Potassium nitrate crystals, KNO3 (toxic)
- Saturated potassium nitrate solution, KNO3 (toxic)
- Safety goggles
- Dropper pipette
- 5 medium test tubes
- Spatula
- 250-mL beaker
- Test-tube rack
- (2) 50-mL graduated cylinder
- 100-mL beaker
- Glass-marking pencil
- White card, 3 in. x 5 in.
- Potassium chloride crystals, KCl
- Ice
- Distilled water

Heats of Reaction

(Semester 1: 3.4 / PH: Experiment 35

- Sodium hydroxide pellets, NaOH (toxic) (corrosive)
- 0.5M hydrochloric acid, HCl (toxic) (corrosive)
- 1.0M hydrochloric acid, HCl (toxic) (corrosive)
- 1.0M sodium hydroxide, NaOH (toxic) (corrosive)
- Safety goggles and apron
- Plastic-foam cup
- 100-mL graduated cylinder
- 400-mL beaker
- Thermometer
- 50-mL beaker
- Centigram balance
- Spatula
- Wire stirrer
- Distilled water

Radioactivity and Radiation

Semester 2: 4.4 / PH: Experiment 52

- Safety goggles
- Geiger-Müller counter
- Forceps
- Meter stick
- Ring stand
- Ring support
- Utility clamp
- Radioactive sources, sealed and kept in shielded container when not in use:
    - Carbon-14, 14C
    - Thallium-204, 204TI
    - Cesium-137, 137Cs
- Shielding materials, 10-cm x 10-cm squares, 1 of each of the following:
    - Paper
    - Wood, 3 mm thick
    - Aluminum foil
    - Glass, picture
    - Lead foil
    - Cotton fabric
    - Plastic (film)

Molecular Models

Semester 2: 5.4 / PH: Experiment 11

- Safety goggles
- Ball-and-stick model set