

Chemicals needed/Where to buy-how to mix chemicals

Chemicals needed:

Common household chemicals-available at most grocery stores, drug stores, or superstores. Most are also available from the Scientific Supply Stores listed below.

1. Ammonia
2. Hydrogen Peroxide
3. Lemon Juice
4. Distilled Water
5. Vinegar
6. Rubbing Alcohol
7. Flour
8. Baking Soda
9. Plaster-of-Paris
10. Vitamin C (Ascorbic Acid)
11. Gelatin Powder (Knox unflavored)
12. Salt
13. Sugar (crystalline-not powdered)
14. White Sand (pet stores have this for aquariums)
15. Yeast
16. Cornstarch
17. Alka-Seltzer (crushed)
18. Tincture of Iodine
19. Assortment of concentrated red fruit juices

Other Chemicals you will need:

1. Calcium Carbonate
2. Anhydrous Sodium Acetate
3. Aluminum
4. Iron
5. Magnesium
6. Zinc
7. Copper
8. Tin
7. 1 M Hydrochloric Acid

Supplies you will need:

1. Chromatography paper
2. Hair-human, dog & cat
3. Baby food jars or other small jars
4. pH paper
5. Dropper bottles (30 ml work well)

6. Magnets
7. Magnifying lenses
8. Spot Plates
9. Small spoons or craft sticks
10. Assortment of manufacturers black felt tip pens
11. Safety Goggles
12. Lab coats or aprons
13. Inkpads
14. Large beakers or petri dishes (depending on what type of chromatography you are going to do)
15. Large jars for waste containers
16. Assortment of pieces of fabric.

Chemicals and Supplies you may need

Recyclable plastics 1-6

Where to buy-how to mix chemicals

Scientific Supply Sites for chemicals, supplies etc. (Not an all inclusive list-just some suggestions)

- a. <http://www.wardsci.com/> 1-800-962-2660
- b. <http://www.fischersci.com/> 1-800-766-7000
- c. <http://www.sargentwelch.com/> 1-800-727-4368

Hydrochloric Acid is sold at the above sites and also sold in national chain stores like Menards, Builders Square, etc. It is usually either in the paint or plumbing departments under the name Muriatic Acid. When sold this way, it is about 3 M. Therefore you need to mix the acid with water in the ratio 2 parts water, 1 part acid to have the correct concentration for this project. If you purchase the hydrochloric acid directly from the chemical supply houses, you can purchase it as concentrated acid which is 12 M or in the pre-diluted 1 M concentration.

The tincture of iodine needs to be diluted. Usually it will only take about 10 drops of iodine in a small dropper bottle of about 30 ml of distilled water to make a satisfactory solution. The iodine is light sensitive. Therefore it needs to be kept in a colored bottle, or a bottle covered in aluminum foil, or in a dark place when not in use. If the iodine solution looks clear, just add a few more drops of the tincture of iodine to it. The metals should be ideally in granular form, although the students may run into them in competitions in flakes or other small pieces.

It is a lot easier to just purchase ascorbic acid in a health food store, drug store, or scientific supply store than to crush up the Vitamin C tablets.

If you do not wish to purchase spot plates, the students can use plastic wrap over a piece of cardboard.

Coffee filters can be used for Chromatography paper if you do not want to purchase chromatography paper-See the section on Chromatography notes.

Generic brands of Alka-Seltzer can be used as well.

Goggles need to be OSHA approved chemical splash goggles for this event. This means that they must have indirect vents. Students showing up to the competition with safety goggles that have holes in the side plastic, such as those sold for woodworking or using a string trimmer will be refused entrance to the event until proper eyewear has been obtained. Proper safety goggles are available from scientific supply sites.

Students will be working with an acid that is capable of eating holes in their clothes. They must therefore wear something to protect their clothing. If you do not want to purchase lab coats or lab aprons, students can use an adult size T-shirt that covers their clothing. Or a garbage bag can have hole cut in it for the head and arms. Just be sure the coat or apron will not cause something to be knocked over or the chemicals mixed together as the student reaches for something. Students should be used to working in their lab coats or aprons so it does not hinder them at the competition. Students will also be refused admittance if they wear sandals into the competition.

Inkpads can be purchased at an office supply store. These are used when the students are learning about fingerprinting.

Students also need to be taught how to use waste containers. It is not good to put the metals and insoluble sand into the sink. Students will be expected to put all of the results of the chemical tests into a designated container. It is expected that the coaches will teach the students to dispose of their waste in this manner. The students need to realize that the water for developing the chromatograms does not go into the waste containers. Also no paper or wood products go into the waste container.

Web site of author for Science Crime Busters:

<http://php.indiana.edu/~lwoz/socrime/index.htm>