



In Conjunction with the American Chemical Society Student Affiliates at the University of Pittsburgh



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THE WELCOME BACK EDITION



Dear Colleagues:

For better or worse, you decide, classes are beginning once again. It is time to get into the routine: determine what classes to drop, what classes to keep, and what room is CHVRN 12B (and who the heck gave the rooms those numbers?).

On behalf of the American Chemical Society – Student Affiliates chapter at the University of Pittsburgh, we would like to welcome the familiar faces back to Pitt from their internships, REUs, and abroad; we hope that your involvement will allow the ACS-SA to be as successful as it was in previous years. To the incoming freshmen, we would like to extend a warm welcome to the University and hope that you will become involved in this award winning organization. We hold weekly meetings in 132 Chevron Science Center at noon on Fridays (if you don't want to come for the science, come for the pizza, but we are sure by the end you will be coming for both). We also would like to invite readers to visit our newly designed website, <http://www.pitt.edu/~chemdept/acs-sa/index.html>, to find out more information about the activities of this student organization.

This issue of the "Chem Major News" contains an application form, which we hope you will fill out and return at our first meeting on August 29th. Moreover, you can find the weekly schedule for the fall term on the back page; as one can see, we have incorporated some new speakers this year but will be joined by a few favorites (George being the exception). There are also a few new activities planned for this year including the Halloween Party with an award for the best costume, a YMCA Outreach followed by our first ever night at the movies with pizza and snacks in 12B (if you can find it by then), and an amazing chemistry event to be held in late February (we won't give details to build suspense).

Again, welcome back one and all, join us for pizza at noon in Chevron 132 on August 29th, explore our amazing website, and prepare for the best ACS-SA year yet.

*Sincerely,
Officers and Staff of the ACS-SA*

2003-2004 ACS-SA Officers and Staff

Gregg Kotchey-Co-President
Matthew Lockett-Co-President
Michelle Mogan-Vice President
Julie Brennan-Secretary
John Henssler-Treasurer
Justin Chalker-Outreach Co-coordinator



Adam Baker-Newsletter Editor
Joan Fletcher-Student Services Coordinator
Liz Humston-Senior Affairs
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CHEM MAJOR NEWS

ACS-SA HOAGIES...

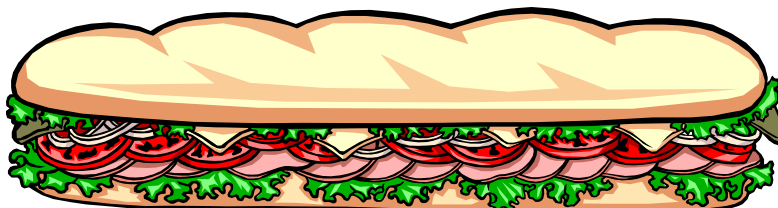


Thank you to everyone
for your continued
SUPPORT!



The ACS-SA will be selling hoagies every Tuesday at lunchtime in the lobby of Chevron Science Center. This year they will be from Uncle Sam's! Details to follow soon....

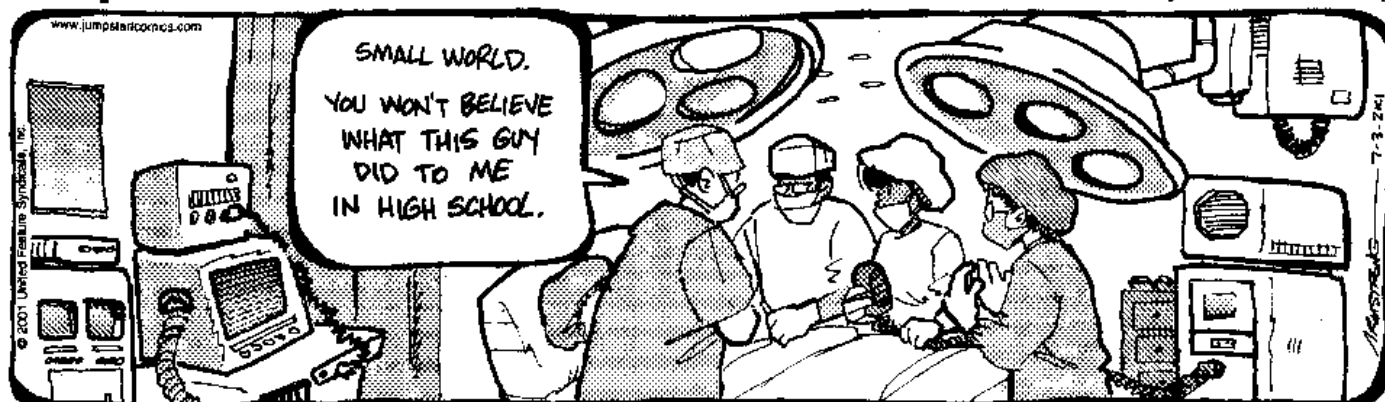
DELICIOUS



ACS-SA Comedy Stress Relief Corner...

Jump Start

By Robb Armstrong



It's That Time Again...

It is time once again to begin a new term and it is also time to break out those new ballpoint pens. As you are sitting attentively in class taking notes, perhaps as a scientist, you have wondered about the ink that is flowing from your pen onto the sheet of paper. To learn more about this marvelous liquid, the editor of Chem Major News checked out the great site "Howstuffworks.com".



The Ink

Ink is a fluid or paste that comes in a variety of colors- usually black or dark blue -- used for writing and printing. It is composed of a pigment or dye dissolved or dispersed in a liquid called the vehicle.

According to Encyclopedia Britannica, writing inks date from about 2500 BC and were used in hieroglyphics found in ancient Egypt and China. They consisted of lampblack ground with a solution of glue or gums. The resulting mixture was molded into sticks and allowed to dry. Before use, the sticks were mixed with water.

Various colored juices, extracts, and suspensions of substances from plants, animals, and minerals also have been used as inks, including alizarin, indigo, pokeberries, cochineal, and sepia. For many centuries, a mixture of a soluble iron salt with an extract of tannin was used as a writing ink and is the basis of modern blue black inks.

Modern quick-drying inks usually contain three things:

The vehicle

Coloring ingredients

- Pigments
- Agents
- Lacquers

Additives

The ink vehicle can be either plant-based (linseed, rosin, or wood oils), which dries by penetration and oxidation, or solvent-based (such as kerosene), which dries through evaporation. The vehicle is a faint bluish-black solution that is difficult to read.

To make the writing darker and more legible, coloring ingredients (dyes) are added. Coloring ingredient can be pigments, which are fine, solid particles manufactured from chemicals, generally insoluble in water and only slightly soluble in solvents; agents, made from chemicals but soluble both in water and in solvents; or lacquers, created by fixing a coloring agent on powdered aluminum. Black, the standard ink color, is derived from an organic pigment, carbon. Colored pigments are inorganic compounds of chromium (yellow, green, and orange), molybdenum (orange), cadmium (red and yellow), and iron (blue).

The additives stabilize the mixture and give the ink additional desirable characteristics. Depending on the medium that the ink is being made for (pens, printing presses, printers) and the material to be printed, the proportions change.

In the case of ballpoint pen ink, the ink is very thick and quick-drying. It is thick so that it doesn't spill out of the reservoir,

but thin enough that it responds to gravity. That is why a normal ballpoint pen cannot write upside-down -- it needs gravity to pull the ink onto the ball.

Unusual Ballpoints

Two of the more interesting developments in the world of ballpoint pens include space pens and erasable pens.

Space Pens

Space Pens, or pressurized pens, are a technological novelty. Take, for example, the Fisher Space Pen. A space pen's ink reservoir is pressurized (~40 lb/sq. in.), and the ink is a special viscoelastic ink (like thick rubber cement). The ballpoint must rotate in order for the thick ink to liquefy, allowing it to write smoothly and dependably on most surfaces, even under water. Ordinary ballpoint pens rely on gravity to feed the ink and have an opening in the top of the ink cartridge to allow air to replace the ink as it is used. There is no hole in space pens, eliminating evaporated or wasted ink as well as leakage from the rear of the ink reservoir. In addition, a space pen can last up to 100 years, compared with the average two year shelf life of a standard ballpoint pen.

Since the 1960s, when the "Space Race" began, space pens have been used by the U.S. astronauts on all manned space flights, including lunar trips, and were also used by many of the Russian cosmonauts on the Soyuz space flights and the MIR space station.

Erasable Pens

Erasable pens were tremendously popular when they were introduced in the early 1980s. They combine the readability of brightly colored or black ink with the eraser functionality of a pencil. While the pens are still manufactured under names like Gillette Eraser Mate, they aren't as commonly used as they were before. Patents US2966418 and US4097290, among others, describe these pens in detail.

What makes erasable ballpoint pens so different from traditional ballpoint pens is the "ink" -- instead of being made from oils and dyes, it is made of a liquid rubber cement. As you write, the ballpoint rolls on the paper and dispenses the rubber cement ink (the resulting mark is known as a trace). Modern erasable pens work by allowing a ballpoint pen to leave a definite and intense black or colored trace which looks like an ink trace, but is capable of being easily erased shortly after writing (usually up to 10 hours). After that time, the trace will harden and become non-erasable.

Erasable ink generally consists of 15 percent to 45 percent (by weight) natural rubber that is dissolved in a series of volatile organic solvents with varying boiling points.

Tentative ACS Fall Schedule

- August** 29 Welcome Back/Recruitment Meeting
- September** 05 "So You Want to Get a Job" with Tricia Hillard from University Career Services
- 12 "Gearing up for Graduate School" with Professor Tara Meyer
- 19 "Hows and Whys of Applying to Professional Schools" with Ms. Jen Cwyklinski from the Pre-professional Advising Office
- 26 Town Meeting
- October** 03 Food Chemistry with a scientist from the H.J. Heinz Company
- 10 "Registration Once Again" with Dr. George Bandik
- 17 Preparatory meeting for National Chemistry Week Celebration at the Science Center with Justin and David
- 24 Pumpkin Painting and Cider on the patio
- 31 Fall Birthday Celebration and Halloween Extravaganza
- November** 07 Special Meeting for our YMCA Outreach Project from 3:30-5:30 p.m. in 12B Chevron Science Center. Movie and Pizza to follow
- 14 "Lanthanide and Coordination Chemistry" with Dr. Stephane Petoud of the Chemistry Department
- 21 Town Meeting
- 28 NO MEETING: Have a great Thanksgiving Break
- December** 06 Preparatory Meeting for Saturday Science and Last Meeting of the Semester

