



Some Incredibly Important Dates to Know...

- November 13:** Spring term (2074) registration begins for non-degree students.
- November 17:** Deadline for undergraduates to apply for April 2007 graduation in 140 Thackeray Hall
- November 22-
November 26:** Thanksgiving Recess-No Classes!
Have a great Holiday!
- December 04:** Last day to withdraw from all courses for Fall (2071) through Arts & Sciences Undergraduate Studies.



Happy Thanksgiving! Congratulations!

On Friday, November 17, 2006, the American Chemical Society-Student Affiliates at the University of Pittsburgh will host the annual Fall Term Awards Ceremony. This year's award winners include the following students:

Richard P. Fiorella	<i>Freshman Chemistry Achievement Award</i>
Kamesh Krishnamurthy	<i>Freshman Chemistry Achievement Award</i>
Zachary D. Pozun	<i>Undergraduate Analytical Award</i>
Melissa A. Forry	<i>Silverman Award</i>

Two of our awardees are ACS-SA members and we are very proud to have them in our gang. We extend our sincere congratulations to all of our awardees for a job well done!

Everyone is invited to attend the awards ceremony in Room 132 Chevron Science Center on November 17th. Come join us as we celebrate undergraduate achievements with our awardees!

NEWSLETTER STAFF: *Melissa Forry-Co-President, Erica Trimble-Co-President, Max Osipov-Vice-President, Ted Boron-Secretary, Zach Pozun-Treasurer, Neil Robertson-Outreach Coordinator, Chris Fennig-Assistant Outreach Coordinator, Rich Fair-Co-Newsletter Editor, Katie Hammer-Newsletter Co-Editor, Eric High-Senior Affairs, Kim Masuga-Senior Affairs, Valerie Mitchell-Senior Affairs, Andy Petit-Senior Affairs, Kanika Gupta-Webmaster, and Regina Mahouski*

The Point is to Find Yourself

by: *Eric A. High*

There are a lot of different ways to study. You can study hard, you can hardly study or you can “study.” You can study by yourself, with a friend, or even in a big group. Sometimes the most important choice, once you muster up the strength to study, can be where to actually do the deed.

Do you study at home, where nothing can distract you...well, except for the internet, Animal Planet, and that all enticing game of Madden with your roommate? What about the library, a place built for studying...outside of the fact that its called “Club Hillman” for a reason? Then there’s always the Old Faithful of study halls, Chevron, but who doesn’t spend enough time here already? Ok, well you could always just leave the country.

Corny intro’s aside, studying abroad is like the cavity free candy shop of studying. You get all of the sweet stuff that comes with being a college student, friends, road trips, and drink specials, without any of the nasty side effects, like finals that actually mean anything. Now before George gets mad at me, there are finals and passing them is still important (C’s are required for credits to transfer). The big difference is that the tests are no longer the point. The point, rather, is to find yourself.

College is supposed to be this period of enlightenment and growth sandwiched between High School and the real world. A lot of the time, however, it just becomes High School 2: Classes from Hell. Nobody grows up, nobody changes and people get so caught up in the competition to get to the next level that they forget the reason for being here at all. This is where studying abroad can change your life.

When I first decided to head to Auckland, New Zealand for a semester, I didn’t know anything about the country or its people other than what I’d seen in Lord of the Rings. All I knew was that I wanted to go somewhere, anywhere (well except Europe because my dad has this weird thing – ask me if you see me) that wasn’t Pittsburgh. Don’t get me wrong, I like it here, but its like I said, sometimes people get lost. Anyway, New Zealand was like this big ball of mystery and I was ready for it.

It didn’t take me long to settle in to ‘normal’ life abroad. After all, Kiwi’s (New Zealanders) aren’t all that different from us. They prefer rugby to football, sheep to cows, and The Warehouse to Wal Mart, but all in all we’re pretty similar people. Well there is this one glaring difference: Kiwi’s have this laid back yet *carpe diem*, seize the day attitude and, trust me, its infectious.

A week into the semester, I found myself bungee jumping off of the highest bridge in Auckland. From there it was all down hill, literally, or uphill, depending on the day. Snowboarding on an active volcano, white water rafting over the highest commercially rafted rapid in the world, sky diving, tramping (hiking), rock climbing, and the list goes on. Every weekend was a trip to some new and distinctive corner of the islands. I had such a great time, that some friends and I ended up extending our stay for an extra month after the semester to tramp around the South Island and see a little of Eastern Australia.

It’s a big big world outside of the walls of Chevron and I think a lot of us tend to forget that. Opportunities like study abroad enable us to step outside of our own shoes and to evaluate ourselves and the world around us. So if you get the chance, take it. Get out of your comfort zone and study on your own terms.



November ñ Itís Not Just About Thanksgiving Anymore

by: Rich Miller, Co-Editor

Typically when most Americans think about the month of November, they envision golden brown basted turkeys, magnificent magenta cranberry sauce, creamy whipped mashed potatoes and the like, hungry yet? Of course all of these things are related to Thanksgiving, the most recognized day in November. However, there is another annual practice which occurs during this month in autumn that many people are not aware of. November 15th is America Recycles Day. ARD is a nonprofit organization that was formed in 1997. The goal of this eco-friendly minded association is to encourage Americans to recycle as well as to buy recycled products collectively. (1)

We as Americans are consumers by nature. This being so, we are all too familiar with the amount of garbage and waste products that we as a nation generate. Reducing the number of toxic landfills which pollute the environment is a top priority. Recycling helps to decrease the volume of materials in these landfills and allows us to breathe new life into things that are no longer considered to be of any use. Contrary to what most people may believe, there are many different materials which can be recycled. The main three categories that we are all aware of are paper, glass, and plastic. But used motor oil, raw materials, alkaline, carbon zinc, nickel metal hydride, lithium ion, and gel cell batteries, electronic equipment, and even your old sneakers can be recycled! (2) In light of all this, it would be difficult for me to write a short article that encompasses every aspect of recycling and still be able to do the subject justice. This is why I will now turn my attention to one of the most recycled products: plastics.

A plastic is any of various complex organic compounds produced by polymerization, capable of being molded, extruded, cast into various shapes and films,

or drawn into filaments used as textile fibers (3). Recyclable plastics can usually be identified by some type of marking stamped or molded into the resin. There are many different plastics that can be recycled, but two of the most common are polyethylene terephthalate (PET, PETE), and high density polyethylene (HDPE). PET is clear, tough, and has good gas and moisture barrier properties. It is most commonly found in soft drink bottles. HDPE is also used to make bottles. However, HDPE has better chemical resistance than PET does. It is for this reason that HDPE is used to make bottles for packaging many household and industrial chemicals such as detergents and bleach (3). So now you might be saying to yourself “Ok, once these materials are recycled, what else can you make from them aside from just more bottles?” Well I’m glad you asked because the answer is surprising.

The possibilities for recycled plastics are endless. Building materials, floor tiles, insulation, railroad ties, disposable plates and flatware are just the tip of this cornucopia. Cleaned, recycled PET flakes and pellets are recycled into spinning fiber for carpet yarns (3). Have you ever heard of polyester? It takes fourteen 20-ounce green soda bottles to make one extra-large T-shirt! I don’t know about you, but I think that’s pretty cool. So as we enter into this year’s holiday season of giving thanks and good will toward men, get into the spirit on November 15th. Who knows? What you recycle today might end up as the new clothes you get for Christmas!

Sources:

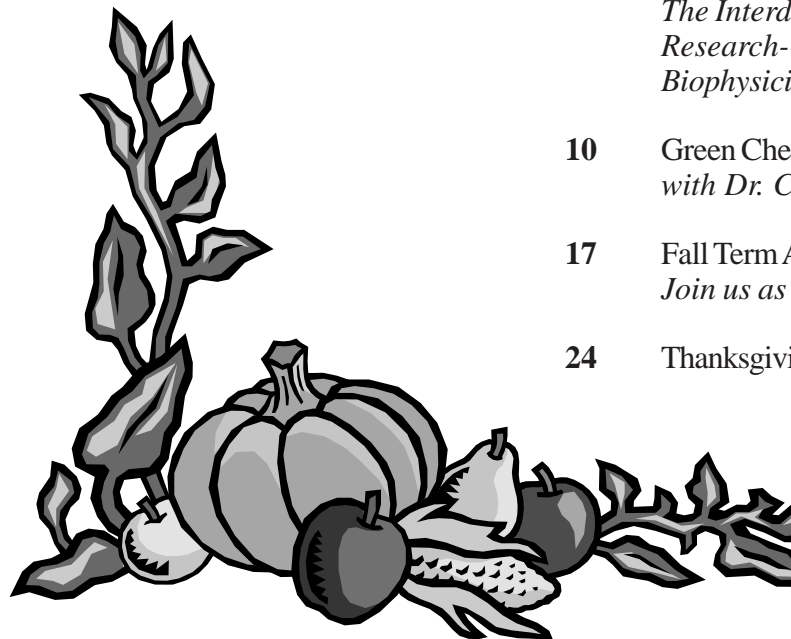
- (1): <http://www.americarecyclesday.org>
- (2): <http://www.recyclethis.org>
- (3): <http://americanplasticscouncil.org>

Save the Earth



Our November Schedule

November



- 03 Dr. Michael Cacscio, School of Medicine
The Interdisciplinary Nature of Modern Biomedical Research--Case Examples from a Simple Membrane Biophysicist.
- 10 Green Chemistry at Valspar
with Dr. Chuck Skillman, University of Pittsburgh
- 17 Fall Term Awards Ceremony
Join us as we celebrate academic excellence!
- 24 Thanksgiving Break--Enjoy!

Everyone is welcome to attend our weekly ACS-SA meetings. Every Friday at noon we get together in 132 Chevron Science Center to hear interesting talks, learn more about science and enjoy each other's company. Come join us for all of the above mentioned meetings.

Saturday Science Academy

Looking for something fun to do on December 2nd? Try Saturday Science! It is an opportunity to help ambitious area high school students learn both general and organic chemistry in the lab. With your help, the students get to make crystal gardens, do a simple thin layer chromatography experiment, witness an acid base reaction with dry ice, measure the pH of some favorite soft drinks, and synthesize slime. Volunteers will play the role of a teacher: demonstrating the experiments, helping the students perform them, and finally, answering their questions. Saturday Science is a fun and rewarding volunteer experience in chemistry. So, are you still looking for something fun to do on December 2nd? Join us for the ACS-SA meeting on Friday, December 1, 2006 at NOON in 132 CHVRN to plan for this great day. If you cannot be there on Friday, e-mail Neil, our Outreach Coordinator at nar12@pitt.edu and let him know you're interested in helping out and then join us on Saturday, December 2nd at 9:00 a.m. in the Chevron Lobby.

Comedy Corner...

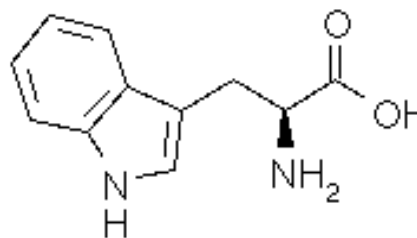
by: Kyle Hovick



PROFESSOR MICHAELS' MUSTACHE,
AFTER DETERMINING IT WAS NOT
GETTING THE CREDIT IT DESERVED,
DECIDED TO GO SOLO.

Molecule of the Month: Tryptophan

By: Katie Hammer, *Co-Editor*



Tryptophan is that chemical in turkey that makes us sleepy, right? Actually, you're wrong, or to be politically correct, you are missing part of the truth. Tryptophan is an essential amino acid; our bodies cannot manufacture it (1). But what does that have to do with feeling extra tired after a Thanksgiving meal?

Tryptophan is a natural sedative. It helps the body produce the B-vitamin niacin which then helps our bodies to produce serotonin, a chemical that calms the brain and plays a role in sleep (1). So by this logic, eating lots of turkey would make us extra sleepy. Actually, tryptophan sedates best when taken on an empty stomach (obviously not the circumstance after a hearty Thanksgiving meal). It is the heavy carbohydrates that make us feel tired as our bodies digest (and often the sedating effect of that glass of wine with dinner).

Tryptophan is also found in milk, beans, beef, and chicken. Experts say the average serving of chicken or ground beef contains as much tryptophan as a serving of turkey does (2).

Genetically engineered L-tryptophan, made from purified bacteria by-products, caused the death of 37 and permanent disability in at least 1500 people when released in 1988 (4). Toxic contaminants were found, the most prominent being EBT, a dimerization product of tryptophan (3). There is still no clear explanation for the outbreak, and the FDA does not currently prohibit the marketing of tryptophan supplements, which are used for insomnia, appetite control, depression, premenstrual syndrome, stress reduction, and other problems.

But have no fear, the average person using a supplement consumes 1000 to 2000 milligrams of L-tryptophan per day. Four ounces of turkey contains only about 350 mg (2). So unless you plan on ingesting roughly a pound of genetically-engineered turkey every day, you don't have anything to worry about negative effects from this amino acid.

By: Katie Hammer

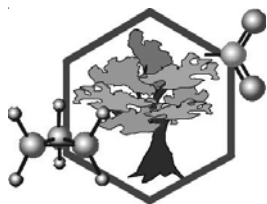
Sources:

- (1) <http://home.howstuffworks.com/question519.htm>
- (2) <http://www.snopes.com/food/ingredient/turkey.asp>
- (3) <http://www.holisticmed.com/ge/trypt.html>
- (4) <http://www.drugdigest.org/DD/DVH/HerbsTake/0,3927,4031%7CTryptophan,00.html>

Molecule Picture: http://www.chemie.fu-berlin.de/chemistry/bio/aminoacid/trp_en.html

Special congratulations to our ACS-SA who received an Outstanding Chapter Award from the American Chemical Society for 2006. This is our 18th consecutive year to receive national recognition! Thanks to everyone. Way to go ACS-SA!





by: *Mike Kowalski*
Green Chemistry Contributor



Hello again, this month's article is all about the twelve main principles that laid the foundation for green chemistry. It is essential to be aware of these principles in order to understand some of the more practical applications of green chemistry. Without these principles, green chemistry would not thrive like it does today. Laid out below are the twelve basic principles and some practical examples of them.

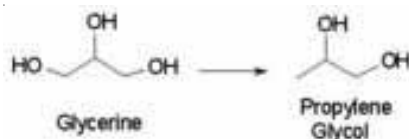
1. **Prevention** – It is better to prevent waste than to treat or clean up waste after it has been created.
2. **Atom Economy** – Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product.
3. **Less Hazardous Chemical Synthesis** - Wherever practicable, synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health and the environment.
4. **Designing Safer Chemicals** - Chemical products should be designed to effect their desired function while minimizing their toxicity.
5. **Safer Solvents and Auxiliaries** - The use of auxiliary substances (e.g., solvents, separation agents, etc.) should be made unnecessary wherever possible and innocuous when used.
6. **Design for Energy Efficiency** - Energy requirements of chemical processes should be recognized for their environmental and economic impacts and should be minimized. If possible, synthetic methods should be conducted at ambient temperature and pressure.
7. **Use of Renewable Feedstocks** - A raw material or feedstock should be renewable rather than depleting whenever technically and economically practicable.
8. **Reduce Derivatives** - Unnecessary derivatization (use of blocking groups, protection/ deprotection, temporary modification of physical/chemical processes) should be minimized or avoided if possible, because such steps require additional reagents and can generate waste.
9. **Catalysis** - Catalytic reagents (as selective as possible) are superior to stoichiometric reagents.
10. **Design for Degradation** - Chemical products should be designed so that at the end of their function they break down into innocuous degradation products and do not persist in the environment.
11. **Real-time analysis for Pollution Prevention** - Analytical methodologies need to be further developed to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances.
12. **Inherently Safer Chemistry for Accident Prevention** - Substances and the form of a substance used in a chemical process should be chosen to minimize the potential for chemical accidents, including releases, explosions, and fires.”¹

An ideal **Atom Economy** is a chemical process in which the amount of reactants equals the amount of products and nothing is wasted. Atom economical approaches have become quite common in the petroleum industry where a great deal of raw materials are used to create the final products. Major changes in atom economy have been increasingly used in the pharmaceutical industry as well to avoid hazardous waste materials.

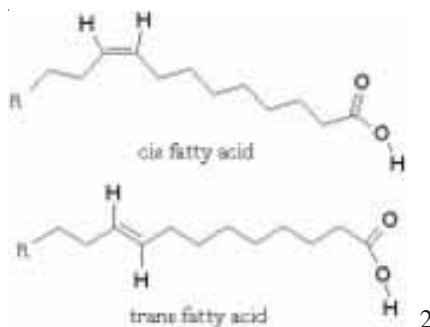
Energy efficiency is another major concept many organizations are working on to promote green chemistry. Energy costs can contribute up to 85% of the total production costs for some products. Some efforts to help lower energy costs are reducing greenhouse gas emissions, renewing energy, using solar energy, wind power, biofuels, and advanced

batteries. It is also best to use natural lighting when possible. That is why many new facilities have large windows with no coverings.

In 2005, the Presidential Green Chemistry Challenge Award was awarded to Professor Galen J. Suppes for converting waste glycerin to propylene glycol. He was able to lower the temperature of conversion of the distillation reaction through a copper-chrome catalyst. Ethylene glycol, a toxic, primary ingredient in antifreeze, is now being replaced by the less harmful and cheap propylene glycol.



In 2002, Novozymes and Archer Daniels Midland Company was awarded the Greener Synthetic Pathways Award for developing a process for the interesterification of oils and fats by interchanging saturated and unsaturated fatty acids. Many products were then able to be made without trans-fats. We are now able to avoid the health concerns associated with trans-fats. This process helped reduce the amount of toxic waste produced and reduced the amount water used. This was accomplished by cutting down on the amount of fats and oils wasted.²



Over the next four articles, several different applications of these twelve principles to the food, pharmaceutical, petroleum, and steel industries will be examined to see how green chemistry is being applied today.

¹Anastas, P. T.; Warner, J. C. *Green Chemistry: Theory and Practice*, Oxford University Press: New York, 1998, p.30.

²"Green Chemistry" October 2006. 16 October 2006. <http://en.wikipedia.org/wiki/Green_chemistry>

³"Green Chemistry" March 2002. 16 October 2006. <<http://www.epa.gov/greenchemistry/index.html>>



CHEMISTRY IN DA' BURG

This is another article in a series highlighting local chemical companies written by our Pittsburgh chemical industry editor, Andrea Cuda.



Hey everyone!

This month, we take a look at the Neville Chemical Company (NCC). Founded in 1925, NCC's corporate headquarters as well as their main manufacturing facility are located on Neville Island, here in Southwestern Pennsylvania. ¹ They produce synthetic hydrocarbon and coumarone-indene resins. Coumarone-indene resins are part of a group of resins that are not highly polymerized. They are the result of polymerizing impure fractions obtained from deeply cracked distillates from coal tar or from turpentine. They are used in adhesives and coatings and are often incorporated as softeners in printing ink, sealants, rubber and plastics such as floor tiling. ²

There are four main types of hydrocarbon resins that are made by the company. These include: aliphatic, petroleum, petroleum aromatics and modified.

Referred to as NEVTAC[®] resins, the aliphatic resins are used primarily in hot-melt adhesives and coatings, pressure sensitive adhesives and wherever immense heat stability is required. These pale yellow resins present distinctive advantages to formulators including: "excellent heat and color stability, excellent resistance to ultraviolet light, acids and alkalis, compatibility with natural and synthetic resins, elastomers and oils, low melt and solution viscosities, facilitating hot-melt processing application, economical extenders for more expensive natural polyterpene."¹

Next is the petroleum resin which constitutes a mix of aromatic/alicyclic makeup and possess both chemical inertness and unsaturated characteristics. The petroleum aromatics are also inert and are nonsaponifiable.³ In ink, the aromatics promote pigment wetting, viscosity control and adhesion. In adhesives, they help with bond strength. The modified is also an aromatic. All three types aid in the tack of their application. ¹

The coumarone-indene resins offer exceptional resistance to alkalis, dilute acids and moisture. High-melting, high viscosity grades are available. These resins are suggested for use in adhesives, aluminum paints, coatings and rubber compounds. ¹

¹ www.nevchem.com

² www.dncustoms.gov.vn

³ www.purelyshea.com

One Wild Place

By: Chris Watkinson

Tired of working in jobs with coworkers who act like a bunch of wild animals? Tired of dealing with their “crap” every day? If you have answered yes to either of these questions, then my internship will be of no interest to you. However, if you were slightly intrigued by the idea of having some wild coworkers, then we have something in common.

I spent this past summer working with the Conservation and Education Department at the Pittsburgh Zoo & PPG Aquarium. While at the zoo I served two positions on a daily basis. My first duty was in animal care. Here I learned basic husbandry techniques of caring for animals. The first duty was the least attractive of all of them. Cleaning the cages and cleaning up after every animal. However, it wasn't as bad as you might think since many of the animals I worked with are much smaller than most typical zoo animals. After clean up I was then responsible for preparing the morning breakfasts for each animal. This was difficult at first until I learned what every animal's diet consisted of. Once the meals were finished and had been distributed we then made sure that animals had been given exercise and that a couple animals each day were given a form of enrichment. After this my second duty began. We crated three animals and took them up the hill to the zoo's amphitheater. Here we put on shows for the guests. Our show was set up like a game show. I had to participate in both parts in the show. The first part was hosting the show. While hosting I was responsible for relaying the message of our department, conservation, while keeping it fun for the kids by presenting all of the games. The second part to the show was the presentation of the animals. Before I could present I had to be taught handling techniques with all of the animals, and then I had to learn all of the information about the habitat, diet, and adaptations for each animal. We did three shows a day. After the shows we returned the animals to their cages. Then I went back to serving husbandry duties. Afternoon meals were then prepared and distributed. This was also the time when our birds of prey and our snakes were fed their mice. I was also responsible for making sure that the animals that were on medication were given and had taken it. Outside of my normal duties I was also able to attend a workshop that was given at our zoo entitled Math in Zoos and Aquariums, where I learned how math concepts can be related and taught to kids using every day occurrences with the animals at the zoo.

These are not the only tasks that take place on a daily basis in the Conservation and Education Department. During the summer months the zoo runs a day camp for kids. During the school year they do many outreach programs at elementary, middle, and high schools all around the Pittsburgh area. They also do many programs for groups inside of the zoo as well.

Even though I am a chemistry major at the University of Pittsburgh, I was able to take my love of animals and many of the observational skills I have learned from chemistry and turn it into an excellent internship experience where I gained vast animal husbandry knowledge and teaching experience.

I expect this experience will serve me well after graduation as I pursue a career in animal husbandry.

