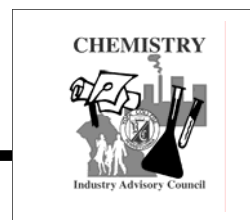


CHEMISTRY INDUSTRY ADVISORY COUNCIL NEWSLETTER

Volume 3, Issue 1

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Steering Committee:

Dr. John H. Lind—Adhesives Research
William Goodfellow—EA Engineering, Science and Technology
Dr. Jeffrey Ross—Armstrong World Industries
Bill Fay—North Industrial Chemical
Kenneth Peterson—Dentsply
Dr. David Kaplan—York College
Dr. Gregory Foy—York College
Bill Glenwright—York College
Chad Linder—York College

Member Companies:



UTZ Quality Foods



WELCOME

Greg Foy

Welcome to the latest issue of the York College of Pennsylvania Chemical Industry Advisory Council's Newsletter! This edition is packed full of all the activities of the council over the past several months. You'll get an in-depth look at our newest council members, descriptions of student intern projects, reports on the latest meetings, and the intended focus of the council for the this year. The Council continues to expand, and look at new ways to enhance the benefits of our industry partners. We need all of our members to get involved in Council activities, and we are looking for more Council leaders to emerge.

IN THE NEWS

Chad Linder

The Grumbacher Sport and Fitness Center, the largest of the four capital projects, is really taking shape. The structure's framing, foundation and roof are nearing completion and walls are begin-



ning to enclose the structure. At 167,000 square feet, the Center will be more than double the size of our existing gym, making it the largest structure on campus,

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CHEMISTRY PROGRAM NEWS

Greg Foy

The York College Chemistry program continues to grow with 75 aspiring chemists joining the ranks this fall! A little over fifty of the incoming students are interested in the Forensic Chemistry major, but quickly learn that this is a Chemistry major with Forensic Chem. emphasis. The required courses in the major differ by only one course, which is the second semester of Physical Chemistry.

The newest Chemistry faculty member is quickly gaining momentum as she jumps headlong into the leadership of the Organic Chemistry sequence. Dr. Kathleen Halligan joined us this fall, and has been hard at work developing both the lecture and laboratory components of Organic Chemistry. Kathleen received her Ph.D. from Colorado State University and finished her post-doc at the University of Georgia prior to joining the York College Chemistry faculty.

Our newest instrument in the lab is a Scanning Probe Microscope. The Veeco SPM has both Atomic Force and Scanning Tunneling capabilities. Several Independent study projects have been started, and several member companies have expressed interest in projects that involve scanning probe microscopy. The ICP-AES (Inductively Coupled Plasma Atomic Emission Spectroscopy) continues to generate interest for independent projects, and we are in the midst of developing an analysis method for one of our member companies.

Upcoming Events:

For a complete list of events please visit: <http://www.ycp.edu/physci/2554.htm>

- CIAC Steering Committee Meeting January 12, 2006
- CIAC Winter Formal Meeting February 16, 2006
- Scholars Week April 24-27, 2006

CIAC Liaison Report

Bill Glenwright

The CIAC Liaison has visited ten member companies and four potential new member companies last year.

Member Companies:

Adhesives Research (three interns, 2005)
 Armstrong World Industries
 BiMax (two interns, 2005)
 Dentsply (one intern, 2005)
 E.A. Engineering
 Gaussian
 Harley- Davidson (one intern, 2005)
 Hawk Creek Labs (New Member)
 North Industrial Chemicals
 York Wall Coverings (New Member, one intern, 2005)

Potential New Member Companies:

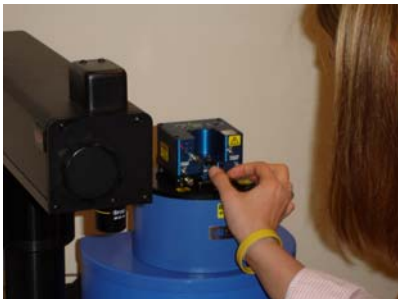
Pfizer, Inc., Lancaster, Pa
 McCormick Foods, Inc., Sparks, Md.

The purpose of the visits is to foster the YCP/CIAC internship and independent study programs and to project the availability of internships and independent study projects at each of the member companies for 2006 and beyond.

Nanotechnology at YCP - "Let's touch some atoms"

Bill Glenwright

The YCP Chemistry Department recently acquired a Scanning Probe Microscope (SPM) which provides two types of topographical analysis capabilities.



The Atom Force Microscope (AFM) function allows one to measure topographical features in the nanometer range (1.0×10^{-9} meters) or roughly one ten-thousandth of the diameter of a human hair.

This range of measurement allows one to examine features on the molecular scale. The Scanning Tunneling Microscope (STM) function allows one to measure features in the Angstrom unit range (1×10^{-10} meters) or roughly one hundred-thousandth of the diameter of a human hair. This range of measurement allows one to examine features on the atomic scale.

The SPM is an excellent instrument addition to our Chemistry Department and will be utilized for both teaching and applied research. As we continue our upgrade of instrumentation, the next instrument on the list will enhance our standard analytical capabilities while upgrading our Forensic analysis abilities. We plan on purchasing FTIR Microscopy later this month. The addition of microscopic IR capabilities will allow manipulation of very small samples, and analysis of highly specific areas of a sample



INTERNSHIP NEWS

Bill Glenwright

Several noteworthy CIAC events have taken place in 2005 to date. All of our interns and independent study students participated in Student Scholars week in April. Posters were presented and dissertations were given.

This Summer ten students interns were placed at six of our member companies and two internships were performed at non-member companies.

Kyle Schmid and Derick Lucas had internships at BiMax Corporation. Erin Slosser had a Summer position with Harley-Davidson which has been extended until May, 2006. Bryan Eigenbrou, Lisa Simmonds and Elizabeth Straney interned at Adhesives Research. Azadeh Azad had an internship with Dentsply. Dan Dewey and Heather Sturgis assisted in the Chemistry lab at YCP over the Summer and Dan currently is employed as an intern at York Wall Coverings. Anthony McCoy has an internship position at Analytical Laboratory Services, Inc. and Cindy Boyer had a position with the Suffolk County, NY Crime Lab.

This June, Dentsply International hosted a CIAC steering committee meeting at their Professional Division in York.

CIAC Internship Summer Picnic



We held our second annual CIAC Internship Picnic at William H. Kain Park in Jacobus. Nine student/interns, eight faculty members and twelve industry representatives gorged on copious

amounts of burgers, sausages and miscellaneous food items, pitched horseshoes and in general enjoyed the



camaraderie. I should be also noted that Chad Linder managed to cook another year without any reported cases of hospitalization.



Student Internship Reports

Cindy Boyer—NY Crime Lab: My experience this summer was working with the Trace Evidence department of the Suffolk County Crime Laboratory. In conjunction with spending a day or two in each of the various sections located within Trace Evidence and the Crime Laboratory, I also visited the other departments within the Crime Lab, including Toxicology, the Medical Examiner's Office, Arson Investigation and Firearms, Drug Chemistry, and Biology.



Cindy Boyer

Within the Trace Evidence department of the laboratory, I spent my time working between the sections of footwear impressions, accident reconstruction, fiber analysis, blood spatter analysis, bullet lacquer analysis, and gunshot residue. Most of my time spent was on working with Linda Parise and her study on gunshot residue (GSR). For me, this study meant working with the Scanning Electron Microscope and testing for gunshot residue. I became knowledgeable enough with the instrument that I was able, at the end of my internship, to collect, prepare a sample, and setup and run a complete GSR test by myself and make a conclusion as to whether the sample was positive or negative for the presence of GSR.

Dan Dewey—York College Chemistry Department: I worked in the York College Chemistry Department along

RELATED WEB LINKS

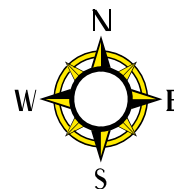
IMPORTANT LINKS:

York College Chemistry Web Site:

<http://www.ycp.edu/chemistry>

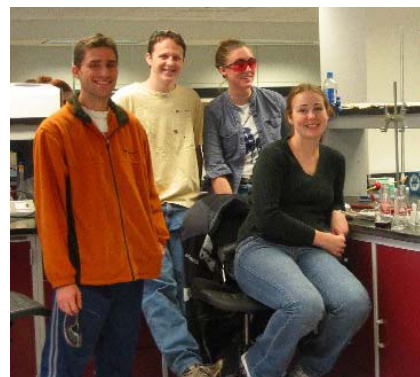
Chemistry Industry Advisory Council

<http://www.ycp.edu/physci/2565.htm>



with Heather Sturgis. We helped the department with organization and maintenance. This included inventory, testing new procedures and equipment, storage planning for classrooms and the stock room, and cleaning and organizing in the labs. We also prepared chemicals and assisted for the summer labs.

This internship provided us with general skills in handling and working with chemicals and equipment and gave us a look at the organizational work involved in running a chemical facility. The lab assistant portion of the internship cemented our general chemistry skills because teaching is one of the best ways to learn.



Anthony McCoy, Dan Dewey, Heather Sturgis, Erin Slosser

Derrick Lucas—Bimax: Bimax provides organic synthesis of monomers and specialty esters for clients worldwide. Many of the techniques used in the research and development, as well as in the mass production of chemicals, consist of classical organic chemistry learned as an undergraduate chemistry student. Such techniques include, but are not limited to: transesterification, vacuum distillation, claisen condensation, and clemenson reduction.

Bimax also uses common analytical techniques to assure product quality. These analytical techniques include gas chromatography, high pressure liquid chromatography, Karl-Fischer moisture analysis, and a variety of titrations.

By working at Bimax, one can learn and reinforce fundamental organic chemistry as well as expand on this knowledge through hands on application and personal interaction with highly educated chemists.

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Student Internship Reports—Continued from page 3

Kyle Schmid—Bimax: This summer I worked at BiMax in Cockeysville, Maryland. BiMax deals with organic synthesis mostly of specialty monomers and polymers. They make many products for several different companies such as General Electric.

Mostly BiMax does esterification reactions to make the monomers and polymers. Direct and indirect esterifications are both used. Exotic alcohols and more simple esters, such as the acrylate ester, are used for the esterifications. I also performed a Diels Alder reaction in the formation of a monomer. Along



Lisa Simmonds, Kyle Schmid, Elizabeth Straney

with the synthesis of organic products, I used analytical techniques such as GC and HPLC to quantify products. Also, some titrations, distillations, filtering and other techniques were used for quality control of the products made.

Elizabeth Straney—Adhesives Research: During the summer of 2005, I worked at Adhesives Research, Inc. as an Analytical R&D intern. I gained experience through hands-on use of several instruments, including a rheometer, TGA, and Karl Fischer Titrator. General lab procedures for notebooks, MSDS sheets, hazard labels, and analytical balance usage were acquired. I helped in the Quality Control department with solution preparation and sample retaining. Using the thermal gravimetric analyzer (TGA), I determined degradation properties of various drug ingredients. I assisted in the development of a temperature ramping method for each of the samples. The TGA analyzed each chemical component of the sample and gave the corresponding degradation peak. The TGA software also calculated the percent volatiles of each sample based on the thermogram.

Using this knowledge, an appropriate method was developed for Karl Fischer analysis. In order to determine the percent moisture content, I used a Karl Fischer titrator for the same samples analyzed with the TGA. Before analysis, I needed to develop a method. Parameters varied for sample size, stir time, and oven temperature. It was determined that liquid samples did not need oven heating and were inserted directly into the titration cell. Powder samples, however, were heated in the oven; moisture was carried to the titration cell via a nitrogen gas line. After analysis, the titrator displayed the percent moisture content found in the sample. These values were compared to the percent volatiles from the TGA.

Overall, my experience at AR was extremely beneficial. The internship exposed me to an industrial lab setting, allowed me to acquire new laboratory skills, and introduced me to many new people. --

Anthony McCoy—Analytical Laboratory Services, Inc.: I am currently doing an internship with Analytical Laboratory Services, Inc (ALSI) in Middletown. My main responsibilities at ALSI include using two distillation procedures to test water samples for the presence of cyanides and also phenols.

Bryan Eigenbrodt—Adhesives Research: My internship was conducted in the Medical Section of Adhesives Research Inc. under Dr. Meathrel. The projects during my internship consisted of formulating different adhesives, testing the physical properties of the adhesive, and using spectrometric techniques to investigate the fluorescence of a variety of films. The objectives of this internship were: to gain knowledge in polymerization, study and understand different properties of adhesives and how altering their properties effects their functionality, and to become familiar with detecting fluorescence on film samples.

Lisa Simmonds—Adhesives Research: During my internship at Adhesives Research, I worked with the pharmaceutical group and learned how they work with clients to design and develop new products such as innovative ways to administer drugs. My internship project consisted of three parts, which required me to construct dissolvable films, test their physical properties, and then test the effect of excipients on these properties.



Bryan Eigenbrodt

Using coating techniques and three different polymers, I created three sets of dissolvable films. I then used a dissolution test and determine the time required for each set to dissolve in deionized water. I then chose the quickest dissolving polymer to continue my study.

The next step of my project was to take this quick dissolving polymer, and use it in combination with a variety of excipients. Five flavors, with different chemical properties were individually added to the polymer-water solution. Films were created and the dissolution tested. With the data, I was able to determine the effect, if any, of each flavor on the dissolution time. Next, the same procedures were used to create a film that contained the polymer and one of three plasticizers. The three polymer/plasticizer films were tested for dissolution, and again the effects of the plasticizers were observed.

The third and final part of my internship project was the creation of binary blends, consisting of polymers and plasticizers for performing strength tests. Using three polymers and three plasticizers a variety of combinations were used to create the films. These films were then tested to determine the force required to break the film. The combination of polymer and plasticizer that created the strongest film was noted.

By the conclusion of my internship, my lab and research

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New Members

The CIAC is proud to welcome both York Wallcoverings and Hawk Creek Labs as new members.

York Wallcoverings, founded in 1895 is the nations oldest and largest wallcovering manufacturer. They provide both residential and commercial wallcoverings that can be found worldwide. Joining as members are William C. Landis, Manager of Research and Development and Bret A. Bowersox, Director of Human Resources.



Hawk Creek Labs was established in 1980 starting with one customer and four employees. Today, Hawk Creek manufactures analytical reagents, water and soil testing kits and specialty chemicals for over 2000 customers. Joining as

members are Frank J. LaCrone Jr., President and Steve Lacrone, Operations Manager.

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CIAC Fall Meeting

The fourth annual Fall CIAC meeting was held October 20th, 2005 at York College. Being that 2005 was the busiest hurricane season on record, it was decided that this event would be held indoors.



Many applauded Dr. Foy for this excellent choice and it was reported that no one suffered hypothermia. After a brief business meeting in the MAC Center, the event convened in Buchele Lounge with an excellent buffet and a challenging round of "Who Wants to be A Millaire?". After intense competition

by six teams, the "Mischief Molars" finished in first place collecting the winning prize of \$400. The team members were Cindy Boyer, Mindy Kenworthy, Adam Barton, Christine Humphrey and Bryan Eigenbrodt. Second place went to "Team O.N.E." (Kyle Schmid, Ron Strine, Heather Sturgis, Krista Vincent and Erin Lubert) securing the second-place prize of \$250. Third place went to "The Go Getters" (Lisa Simmonds, Jessica Parmelee, Eric Maragulia, Adam Usciak, Suzanne Lopez, Renee Peterson and Jenny Crosbie) winning \$150. There were no losers per se because a good time was had by all and everyone had the opportunity to meet with the various CIAC member representatives.



In The News—Continued from Front page

and providing students with a truly enhanced experience.

The Grumbacher Sport and Fitness Center will include a new arena for basketball and volleyball, a large field



house (pictured at right) for intramural sports and for indoor practice, a wrestling room, a natatorium with an 8-lane, 25-yard pool, and aerobics and strength training facilities. Racquetball courts, indoor track and a climbing wall will allow students to challenge themselves and each other. A "cyber café" on the first floor will offer food and Internet connections, and will provide a meeting place for students.

The Grumbacher Sport and Fitness Center should be completed April of 2006.

Student Internship Reports—Continued from page 5

skills had developed, giving me the confidence to take on projects in which I have little or no background. Throughout the summer I participated in group and company meetings that allowed me to interact in different areas of the industry, as well as research.

Erin Slosser—Harley Davidson

I worked at Harley Davidson in the plated components department for my internship this summer. The chrome plater is composed of 36 stations and a conveyor with large racks that hold the parts. Stations 1,2,4,8,12,15, and 22 are all tanks that clean the steel parts. One, two, four and 12 are alkaline tanks made up of a KOH based proprietary concentrated cleaner. Tank 8 is a proprietary acid cleaner that uses cathodic current. Tank 15 and 22 are sulfuric acid cleaners and act as activators which aid in the adhering of the nickel or chrome layers. Tanks 17 and 18 are aqueous nickel solutions which electrochemically plate on the steel. Tank 24 is aqueous chromium which is electrically plated over the nickel. The other tanks are water rinses.

My duties included performing acid base titrations of the cleaning tanks. If the cleaners are not at the correct concentrations then it compromises the integrity of the nickel layers. The chrome tank must be titrated for the chromate concentration and also have a precipitation reaction to determine the sulfate content. A ratio is then calculated. I also simulated the nickel plating process using a hull cell which is a small container that plates on a brass panel that is about 5"x3". This shows the current density and any defects that may appear on an actual part. Based on the panel chemical additions can be made to the actual tanks to prevent any further defects. Tank 34 is called the "rack stripper" which cleans the metal tips of the racks. This tank is analyzed using a distillation reaction and 2 separate titrations. I was also involved in ordering chemicals, reviewing new chemicals and submitting the MSDS for consideration, troubleshooting problems in the plated parts, and aiding in a major upgrade to the chrome plater. Everyday I produced an instruction sheet to communicate with the union workers what chemical adds or maintenance needs to be performed in the off shifts.