



no. 5

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Catalyzer

44th International Chemistry Olympiad United States of America

Alexander Tukov, PhD Student,
Russian Academy of Sciences, Moscow,
bronze medalist of the 35th IChO, 2003,
Athens, Greece



Alexander Tukov

Prior to the olympiad the Ukrainian team had intensive theoretical and practical training at the Chemistry department of V.N. Karazin Kharkiv National University. We fundamentally reviewed all topics related to the preparatory problems. Thanks to remarkable lecturers this training was very useful both for solving tasks at the olympiad and during university courses afterwards.

The theoretical exam at the 35th IChO was a little different than I expected. It featured many but quite simple problems (multiple choice tests) and only a few complex theoretical problems. To my mind, that exam predominantly required quickness and attentiveness, but not deep knowledge and creativity. Hence, many students got very high points.

The practical exam was in line with my expectations. It included organic synthesis and an analytical part (including qualitative and quantitative analysis). Due to the relatively simple theoretical exam, the practical one appeared to gain elevated importance.

I was very glad to take part in the International Chemistry Olympiad. This gave me an opportunity to meet a lot of young gifted people from all over the world. Amazingly, later I met some of them at the University and conferences. The olympiad definitely gave me aspiration for further learning and still inspires me for success in any activity!

Lab Practicals: Advice from Past Participants

Mykhailo Vybornyi, PhD Student, Department of Chemistry and Biochemistry, University of Berne, Switzerland, silver medalist of the 37th IChO (2005, Taipei, Taiwan)



Mykhailo Vybornyi

It's been really something incredible being a part of the Ukrainian team for the 37th IChO. In May 2005 I was aware that in a few months I'd be surrounded by the best young chemists from all over the world. Even more – I'd be a part of this community. A lot of questions arose immediately: how should I spend my time before the Olympiad, what thing should be done, books should be read, etc. I felt a high degree of responsibility, and now I think it was the most difficult thing I dealt with seven years ago. And then I realized that there wasn't enough time for thoughts about how and when to do something. I just kept doing things I used to. I relied on my own method of preparation for the Olympiad – solving sets of different types of problems from previous IChO's handbooks, various National Olympiads, etc. And it's really worked out. At least I felt myself patient and confident before the theoretical exam.

The trickier story was about the practical exam. In my opinion, you can't totally rely on your knowledge, because sometimes things happen that even the professional chemists fail in their experiments due to numerous circumstances. In normal life it's not a total disaster, unless during the IChO. This competition has time limits, so generally you have only one possibility to perform your practical tasks and get final marks. Of course your personal experience means a lot in this case, but a little piece of luck is vitally important. The last sentence can be attributed to many life situations.

The Closing Ceremony of 37th IChO was quite difficult for me. I understood that it was the end of a great and unforgettable period in my life, and the beginning of the brand new chapter at the same time. Our life is built from such small bricks. And the end of one is only the beginning of something new. Just don't stop and keep going. I'd like to wish good luck to all participants.



Celebrating International Excellence in Chemistry

The Cori Cycle: Understanding the Science of Carbohydrate Metabolism



Photos courtesy Becker Medical Library, Washington University School of Medicine

In brilliant collaboration, Carl and Gerty Cori studied how the body metabolizes glucose and advanced the understanding of how the body produces and stores energy. In 1947 the Coris shared a Nobel Prize “for their discovery of the course of the catalytic conversion of glycogen,” with Argentine physiologist Bernardo Houssay.

When they met in 1914 during their first year of medical school in Prague (then in the Austro-Hungarian Empire, now Czech Republic), Carl Cori and Gerty Radnitz found they shared a love of research and an enthusiasm for mountain climbing. In 1920 the two received their medical degrees, published their first research paper together, and were married.

Despite their collaboration as equal partners, Gerty encountered many hurdles as a woman researcher at the time. Eventually the Coris moved to America to pursue their research together, settling at Washington University in St. Louis, Missouri.

An early breakthrough in their research came with the discovery of the “Cori cycle.”

The Cori cycle explained how the body reversibly converts glycogen, a carbohydrate and derivative of glucose, into lactic acid in muscle tissue. The Coris’ findings were particularly useful in the development of treatments for diabetes.

A later breakthrough came when the Coris determined a new intermediate of glycogen breakdown, glucose-1-phosphate, also known as the “Cori ester.”

The American Chemical Society designated the research of Carl and Gerty Cori on carbohydrate metabolism as a

National Historic Chemical Landmark at the Washington University School of Medicine on September 21, 2004. To date, more than 65 achievements in chemical science and technology in the U.S. and abroad have been recognized by the program. For more information, visit www.acs.org/landmarks.



Top photo: Carl and Gerty Cori in their laboratory at the Washington University School of Medicine in 1947. Above: Gerty and Carl Cori at the Nobel Prize presentation ceremony in Stockholm, Sweden, on December 10, 1947.

Innovation

The chemical industry conducts more than \$23 billion of research and development, with one out of eight patents resulting from this effort. However, Dow believes our industry has to move from a philosophy of creating products in a manner which does no harm to creating innovations that do more good.

Dow innovation is powered by an industry-leading research & development organization focused on delivering solutions to the world’s challenges of today and tomorrow in a responsible manner. By aligning to the four megatrends, our innovative solutions find their way into products that make people’s lives healthier, safer and more convenient.

In 2011 alone, Dow invested more than \$1.65 billion in research & development—one of the largest investments in the industry.

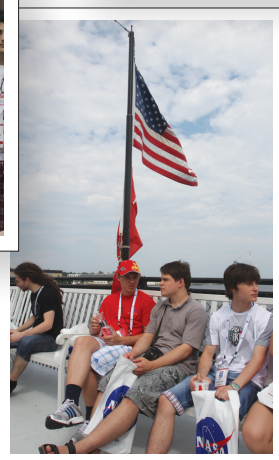
However, our goal is not to spend the most, but to be the most productive. In the same year, we introduced innovations for oil and gas exploration, production and recovery; the world’s first

zero-saturated-fat Omega-9 Sunflower Oil; and a solid state lighting platform for LED displays.

Dow has the creativity, knowledge and insight to innovate and the resources, discipline and skill to deliver unique solutions to the world. By connecting science with societal needs, our robust innovation engine allows us to solve some of the most challenging problems in the world.



Photos from NASA, Picnic and Annapolis, Maryland



Quick Quiz Answers

The clever part is that chemists and non-chemists give wildly different answers to the questions; both types of answers are 'correct' but totally reveal if you are a chemist or not!

Tuesday, July 24 Schedule

	Students	Mentors and Observers
morning	Safety Instruction / Practical Exam	Washington, D.C. Tour
afternoon		Meeting with Authors
night	ACS Pres. Demonstration	2nd Jury Meeting

Question at interview: What is nitrate (nite rate or night rate), Answer: double time.

ITS A JOKE 

Tonight's Event...



ACS President Bassam Shakhshiri

Tonight features a demonstration show by chemist and educator Bassam Shakhshiri. His show is based on proving that "Science is Fun!" Look forward to an evening of spectacular reactions and unexpected effects, all wrapped in a high-energy presentation. As Shakhshiri says, "I'm a strong advocate of demonstrations—exploding balloons, glowing liquids, spectacular chemical transformations. Connectivity is key. My ultimate purpose is to trigger cerebral and emotional reactions to heighten an audience's joy of learning."

On the cover masthead: American scientists Benjamin Franklin, Thomas Edison, George Washington Carver and Gerty Cori.

*Good Luck
with Your
Lab
Practicals!*



Leandro Luis Missoni
Argentina, July 24

**Happy
BiRtHDay!**



Weather Today
SUNNY
95° F (35° C)

Weather Tomorrow
SUNNY
91° F (32° C)

Puzzle

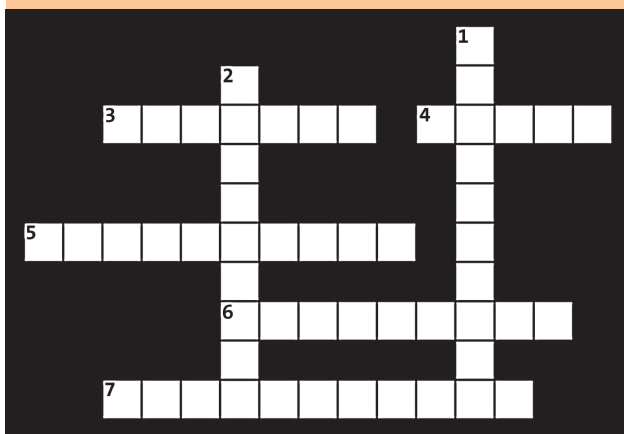
Scientific Instruments

Across

- Used to measure an object's mass.
- Used to measure an object's weight.
- When the wind blows, this spins.
- Used by astronomers to study stars and planets.
- This is used to measure temperature.

Down

- If you want to see a cell, use one of these.
- Used by meteorologists to measure air pressure.



Answers are in issue #6.

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