

# Catalyzer



Journal of the 39th International Chemistry Olympiad Moscow Russia  
Issue no.6 Thursday 19 July 2007

## ***Chemistry links everything***

*Prof. Duckhwan Lee (Director, Science Communication Program, Sogang University, Seoul, Korea)*

To begin with I'm sure that practical exam should be (and would be) a great success, because it's organized by a very professional team. I was organizing this Olympiad last time and I know what hard and tiring this job is. It's a difficult task to arrange everything convenient for 256 people, because it's concerned with chemicals and sophisticated equipment.

There are not so many students who study practical chemistry at school. Our Korean students were selected from very specialized schools with special scientific groups (as Moscow Chemical Lyceum, a school Leonid Romashov from - M.N.). And I'm glad that now it's being held at Moscow State University, in this citadel of science built by Stalin and history with old traditions. It's very important (as I usually tell my students) to feel the connection between history and modern times. Even chemistry is a modern science it has its own history as well.

Our government understands the necessity of investigating in science and technology. Chemistry is a science of future: especially nanotechnologies and biochemistry. And we have made a dramatic progress while last 10 years only due to the science, education and innovative technologies. When the society is poor, it doesn't recognize the role of such things, because they don't feed their needs directly. Common people don't understand the importance of high level science and technology. When it becomes rich, it can invest in future and contribute into science



and education, in future development and the science is becoming closer to the majority of people.

I was trained as a theoretical chemist (I don't like experiment personally). Chemistry mostly is a practical and applied science and the role of the experiment should be emphasized. But it can't be done properly without the base of theory. I should say that they are both important and can't be separated.

Chemistry links everything: history and modern times, science and society, theory and practice.

*Maria Nefedieva*



***And where are the planets, the stars and the Moon from? Can it be chemistry?***

***M. Zoshenko***





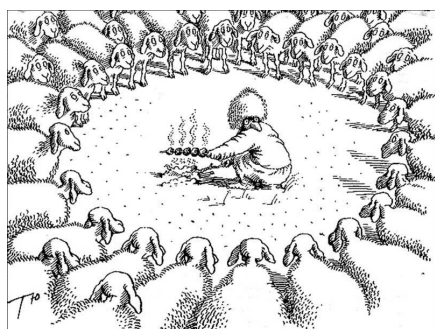
***“Get your facts first then you can distort them as you please”. Mark Twain***



***Use your brain***

## **Why the strawberry became sour?**

**Question.** People in Russia love strawberry and its jam very much. A strawberry is grown up almost in each part of the country. To keep it till winter, a fragrant sweet strawberry is usually frozen, sending in the freezing chamber. In winter it is taken out to regale. But here the trouble is - a strawberry became sour! Why?



**Answer:** If the strawberry became sour it means that sugar disappeared. What has occurred to it? Sugar has decayed owing to enzymes. But this answer can seem illogical to you - in fact, at low temperature the speed of all reactions are sharply slowed down! It is really so, however in case of a strawberry one more circumstance works. During freezing pure water is being frozen first of all. It means that the part of water is deduced from an endocellular solution, and concentration of other components sharply rises. It means that speed of fermentation processes also increases. Besides, small crystals of ice destroy cellular structures, liberating enzymes thus raising their concentration. In that way sharp growth of concentration of reacting substances wins downturn of temperature. Especially, if cooling is not very strong.





***"The are only two tragedies in life: one is not getting what one wants, and other is getting it". Oscar Wilde***



***Use your brain***

## ***Frog and milk***

**Question.** When refrigerators haven't been invented yet, peasants in the Russian villages stored milk in clay jug and threw a cold, slippery frog in it. And actually, milk remains cool and did not turn sour. Why?

**Answer.** It paradoxical sounds but frog really was used as an alive refrigerator. The matter is that the skin secret of a frog allocates bacterial poison - enzyme lysozyme. So the frog protects itself from bacteria, and at the same time milk. By the way, lysozyme is in crude eggs, in our tears, and in a radish. But why does milk remain cool? The reason is in the jug. The jugs are made of usual ceramics which is penetrated by the most thin pores. Under the action of capillary forces water from milk filtered through walls and evaporated. And we know, that evaporation is an endothermic process going with absorption of heat. Therefore the filled jug always remains cool.



### After the hard day

#### Andrew Tulloch (Australia):

About the exam: It was really doable, we had to do everything perfectly, but made many mistakes, I think in the first question. It wasn't harder then we have seen before. Everything depended on the emotions.

About yesterday's trip: It was a heavy mix of sport and dancing.

Russian food: It is good, but we haven't eaten much.

MSU: It is rather good university.

I think that here you are able to be creative, intelligent and funny, Chemistry Department is a mixture of chemistry and physics. There is very good nature at the territory of the MSU, buildings are in trees.

Why he chooses chemistry: It is something that I really like to do. It's both science and art. You can be very creative here. Being a chemist you can help to solve world problems and that's why I like it.

Friends: We have made many friendships. There are many in-

teresting people from India, Asian countries, Iceland. We wish them good luck. We hope that Australia will get the first prize, of course. But we think the team of New Zealand – they are our neighbors – will win. We support them.

#### Freddie Manners (The UK):

About the MSU: I have seen the Moscow State University only on the picture. The building was great. But it's really better than I thought.

#### Jim Ge (Australia):

I have ruined my equipment and there was a real problem. The exam was rather difficult, nevertheless I coped with it.

#### Raul Joao de Sousa Pereira (Portugal):

I burned my fingers, because I was in distraction. I didn't follow one of the rules of security: taught the solution. Now I don't feel pain because I was given some medicine. I think it can influence the results of

my exam and can bring a lot of pain in future. But I haven't stopped the exam because I have felt better and decided to make something. I was thinking only about the tasks of the exam. And the place I will take is not very important.

And one boy is a real hero. He took part in the exam with the broken leg. He is from Iran:

Yesterday we were playing volleyball. I fall on the grass and felt the pain in the leg. Than we went to hospital and spent there a lot of time. But I decided to take part in today's exam. It was difficult because I have to get some tubes from the table that was rather far. So I had to stand.

But I've managed everything and I'm happy. Today will celebrate!

*Ekaterina Bredina  
Ekaterina Davydova*

### Lessons in Russian

Would you like to dance? - Хочешь потанцевать? - [hochesh potansevat]  
May I have your adress and telephone number? - Ты можешь мне дать свой адрес и номер телефона? [ti mozhesh mne dat svoj adres i nomer telefona]

I like your smile - Мне нравится твоя улыбка [mne nraivsja tvoja uli:bka]  
What is your name? - Как тебя зовут? [kak tebj zavut]  
My name is... - Меня зовут... [menja zovut]

Were are you from? - Откуда ты? [otkuda ti:]  
I am from... - Я из... [ja iz]  
Beautiful! - Красиво! [krasivo]

### Call

**Police - 02**

**Fire station and ambulance - 911**

**39th IChO office (for urgent calls only):**

Alexander Gladilin +7 (916) 555 - 70 - 27

Vadim Eremin +7 (916) 611 - 88 - 90

Elena Eremina +7 (916) 133 - 00 - 55

**Mentor Support:**

Alexander Veresov +7 (910) 452 - 41 - 23

**Student support:**

Ekaterina Yakubovich +7 (916) 676 - 91 - 00

**Guest support:**

Alexandra (Shura) Prokhorova +7 (916) 587 - 60-26

### Tomorrow program Friday July 20th

7.00 - 7.45 Breakfast, Olympiets

8.00 Busses depart to the Theoretical Exam, MSU

10.00 - 15.00 Theoretical Exam, MSU

15.00 - 17.00 Lunch, MSU

17.00 - 18.00 Walk to "Vorobjovi Gori" berth

18.00 - 22.00 Re-union Party on a boat, dinner included

22.00 Transfer to Olympiets

### The issue is prepared by:

Head of the project: Lukichev Alexander // Project managers: Salynkina Irina, Galieva Alina // Correspondents: Agaeva Aysel, Bredina Ekaterina, Davydova Katya, Eremina Maria, Kravtsova Anastasia, Pomerantseva Anna, Sabanova Alina, Nefedieva Maria // Correctors: Anna Berkovich, Sergey Sobolev, Yulia Valeeva // Photographer: Lobus Alexander // Designers: Turin Vadim, Lukichev Ilya  
Published and printed by Trace light studio ltd // Call us: +7 (495) 939-26-66 // E-mail: luk-mail@mail.ru

**MAIN SPONSOR**



**MAIN PARTNER**

БЛАГОТВОРИТЕЛЬНЫЙ  
ФОНД В. ПОТАНИНА

**SPONSORS-  
PARTNER**



**SPONSORS**

**analytikjena**



**INFO SPONSORS**

**Карьера-пресс**  
издательно-кадровый кондинг