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# Now it all ties up

Periodical system turned out to be widely used among chemists as a fashion design template. Peter Wothers wearing his favorite Mendeleev-style tie at the 45th IChO Opening Ceremony.

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## Today is gonna be the day | *Catalyzer's tips*

8.00-9.00 Breakfast	Taste the white cheese pudding. White cheese (aka cottage cheese or curds) isn't very popular outside Russia, and this way of cooking is just exclusive. We add semolina and sour cream so that the dish tastes like pudding.
9.00-12.00 Free time	Breathe the air of freedom before the experimental tour starts.
12.00-13.00 Lunch	Try borsch. It's Russians' and Ukrainians' favorite red beetroot soup.
13.00-14.00 Transfer to Kremlin	When entering the city our bus crosses a river. It's the same river you saw yesterday near the Red Square. Moskva river twists a good deal across Moscow, so you can even try to count how many times you'll cross it today.
14.30-17.30 Tour around Kremlin	Most muscovites don't even know that there's a new attraction in Kremlin: a helicopters pad in the corner of the ancient fortress with two helicopters belonging to President Putin and Premier Medvedev.
17.30-18.00 Walking around Alexandrovsky	Walking around the Alexandrovsky garden ask the guide how is this possible that there's a river right under your feet.
18.00-19.00 Transfer to Planerneye	So, how many times have you crossed the Moskva river today?
19.00-20.00 Safety training before the experimental tour	Just listen.
20.00-21.30 Dinner	Try boiled potatoes with dill, Russians love it both as garnish and main course.

# ICHO Opening Ceremony

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Cossack choir and Russian folk music brought a certain Slavic zest into the international ceremony. The big hall of the Fundamental Library aka "MSU Think Tank" was decorated with ethnic suits of 77 countries. The MSU Rector **Victor Sadovnichy** wished success to the whole Olympic movement. Chemistry faculty Dean **Valery Lunin** promised the contestants will like the tests. Chairman of the IChO International Steering Committee, **Peter Wothers** confessed that what has always amazed him most about chemistry was Mendeleev's great beard, and afterwards showed his tie designed in the periodical system style.

## Alexander Rodenberg Germany

Those Cossacks' funny dancing are very thrilling. I suppose Cossacks were singing about life, partying and drinking... What impressed me was Russian «balalaika». And I can't deny that Russian musicians are really talented.

## Tas Yusoontorn Thailand

Now I know Russian people are pretty good dancers. Cossacks were really impressive and energetic. I was especially shocked when they were doing it with those sharp swords. Russian women were beautiful and their dresses were very peculiar.

After the Opening ceremony folks were wondering what the foot-tapping Cossacks were singing about. Catalyzer tried to transliterate and translate the song so that you could try and sing it.

### The song lyrics

Розпрягайте, хлопці, коней,  
Тай лягайте спочивать,  
А я піду в сад зелений,  
В сад криниченьку копать.

Маруся раз, два, три, калина,  
Чорнявая дівчина  
В саду ягоду рвала...  
и т.д.

### How you can sort of pronounce that all if you're an English-speaker

Rose-pray-guy-tea chloe-p-tsi co-nay  
Thai lie-guy-tea spore-cheer-watt  
Are ya pea-doo f sard zee-lonely  
V sard crane-itching-coo co-part

Morose-say Ross! Dwarf! Tree! call-  
leaner  
Chir-narwal dif-chin-are  
F sudden ya-go-door-wall-are...

## Philip Zoran Ilievski FYR of Macedonia

It was a great show. As I'm fond of Russian culture I heard the song Cossacks were singing, the one about the horses, so I was very excited. We also know your national song "Kalinka"... By the way, what does Kalinka actually mean?

### And the meaning:

Guys, unhitch your horses  
And go to bed,  
As to me, I'll go out into the  
green garden  
To try and dig a well  
Marusya, one two three.  
arrowwood,  
A black-haired girl  
Was picking up the berries  
etc.

# A Country in Brief

Every day Catalyzer picks a random delegation and goes to meet the team.



**The French team** consists of four friendly guys. Two of them are from Paris, the other two come from Clermont. We asked them to tell us about each other.

### Team about Dorian Canham

He's the eldest guy of the team. He's good at chemistry and physics. Except science he's interested in badminton and music. Fond of organic food.

**Dorian on his country's great inventions in chemistry:** "The coolest ones were Antoine Lavoisier who studied mass changes during chemical reactions, and Yves Chauvin who developed methods of synthesis in organic chemistry"

**Team about Valdo Tatitscheff:** He's the tallest of us! He enjoys table tennis. He's keen on music, he can even compose... He likes singing and whistling!

**Valdo on chemistry education in France:** "The level of chemistry is a little low, it is not as good as it should be. We begin to study chemistry at the age of 15 or 16 and I think it is really a little late. The subject is compulsory. But what I really like about chemistry in France is that there is a lot of organic chemistry!"

**Team about Clement Robert:** He enjoys climbing. Unlike many Europeans he really likes reading books, especially science-fiction.

**Clement chooses the most typical frenchman of his team:** "The most typical would probably be Valdo, because he is a bit impatient, sometimes complains a lot; he also likes cheese and wine, and he is very romantic...")

**Team about Jean Michallad:** He loves asking questions. He enjoys volleyball and is pretty good at playing violin.

**Jean on how he'd like to contribute to chemistry:** "I want to work with solar energy. Using modern materials I want to get more energy out of the sun"

**Loving Chemistry in French**  
**Mild version** *J'adore la chimie*  
**Tough version** *J'abhorre tous que la chimie*



# What's chemistry coming to?

Catalyzer regularly talks to mentors about how they see the present and the future of chemistry, chemical education and the role of their country in the world scientific progress.

**Basil Wicky,**  
**Sebastian Keller,**  
Switzerland

**Lucia Meier,**  
**Michelle Frei,**  
Liechtenstein

## The future of chemistry

**Basil:** Chemistry is obviously getting more and more merged with other sciences: material sciences, biology. Most probably it's finally stop existing for its own sake. The only purely chemical science might be organic synthesis.

**Lucia:** Wait, there's always pure chemistry in the base of everything. But I agree that the research are moving towards studying something that can be directly applied.

**Sebastian:** And I, as a theoretician, will say that chemistry is moving towards becoming a predictive science rather than empirical. Maybe in 50 years there will just be a super computer building molecules, so the chemistry will all be in interfaces.

**Basil:** Yeah! It will be amazing if we get able to predict the reaction rather than conduct it.

**Michelle:** Haha, I hope I can see this before I die.

## Fields of human activity where chemistry will gain importance

**Michelle:** Green and sustainable energy.

**Sebastian:** Food and additives.

**Lucia:** Pharmaceuticals.

**Basil:** It would also be cool if chemistry developed in connection with information processing,



you know, if it can be silicon-based...

Passion.

## The substance your country is associated with

**Lucia:** Well, in Liechtenstein chemistry is not very developed. We can't say the substance.

**Basil:** Why not lignin?

**Lucia:** Oh, right, lignin. It's the thing you get from wood, something like resin.

**Basil:** You can use it to print banknotes. Which Liechtenstein is obviously doing!

— And Switzerland?

**Sebastian:** Well, LSD was invented in our country...

**Michelle:** Erm... Maybe chocolate is better?

## Country's recent discoveries and future role

**Basil:** In the last couple of decades we've got two Nobel Prizes: Richard R. Ernst got it for developing nuclear magnetic resonance spectroscopy and Kurt Wüthrich was awarded for determining the three-dimensional structure of biological macromolecules in animal proteins. So if we keep doing what we're doing I guess we'll be in charge of fine chemicals and biotech.

## What makes a good chemist?

## The new generation of chemists

**Basil:** This generation is different in a way that these guys are more willing to accept computational theoretical studies than the old professors tend to do. So chemistry is going to become more about bio interfaces. I still see people who don't believe computer simulations of natural processes, they say "show us the actual experiment". That's going to gradually disappear, people will get used to computational modeling type of world and that's what predictive sciences will look like. Quote: "Make your students swim in deep waters, at least those who float are of promise"

## Records | Moscow Tour



**Gatis Ogle** from Latvia was sure the Red square would be pretty red.

A common misbelief about Red Square is that it's called so because of the brick color. In fact the modern Russian word "red" – красный [krassny] – used to mean "beautiful" in the old Russian, so the square was in fact called awesome.

Croatian **Filip Kozlina** said the Kremlin "was smaller than he thought it would be, but still amazing and really beautiful". He compared Red Square with the main square in his native town and found Red Square pretty big.



**Bana Josipa Jelačića** square is the main city square of Zagreb named after Croatian-born Austrian commander and Croatian ban (governor).

**Swiss team** reported they feel very small near Lenin's Mausoleum, because they "feel the pressure of history at this place".

No wonder Lenin Mausoleum size and construction are so oppressive. Made of reinforced concrete with brick walls, lined with granite, decorated with marble, quartzite and labrador, the Mausoleum has a 100m<sup>2</sup> Hall inside and a 60-ton (!) granite slab.

**Maria Fala**, Cyprus: «I liked the architecture of Moscow, there are totally different buildings. Ones are very old, others are new, and they're all mixed! I'd like to come back».



photo by Ada Maria Krzak, Denmark

# Chemical composition

**Cu** The first stars of the Moscow Kremlin towers were made of **high-alloy stainless steel and red copper**.

 In the middle of each star there used to be a hammer-sickle symbol made of **semi-precious stones** covered with **gold**.

**H<sub>2</sub>O** But they quickly faded because of **rain and snowfalls**, besides they looked awkward in the overall composition of the Kremlin. In 1937 they were replaced by new glowing stars made of **ruby glass**.

# Meet Russian Chemists



**Vladimir Markovnikov**  
(1837–1904)

## First steps in chemistry

Studied law at Kazan University, but then got impressed by practical studies in the chemical laboratory guided by Alexander Butlerov and changed for the science department.

## Contribution to chemistry

Investigated the mutual influence of atoms in organic compounds. In 1869 formulated the rules of pathway for the reactions of substitution, elimination and addition on the double bond and the isomerization depending on the chemical structure (Markovnikov's rules).

In 1883 discovered a whole new class of organic compounds – naphthenes.

Proved the existence of cycles with the carbon atoms number from 3 to 8.

Was the first to synthesize cyclobutanedicarboxylic acid (1879), and cyclic ketone – suberon (1889).

## Interests

Investigated the composition of Caucasian oils, derived a number of individual substances from them.

Took the first attempt to chemically classify the oils.

Organized a health service in the army during the Russian–Turkish War of 1877–78.

Studied the nature of salt lakes (geology).

**Quote:** “Make your students swim in deep waters, at least those who float are of promise”

**×3** Triple glazing: **crystal glass**; **milk glass** – 2 mm thick to scatter light and hide the **tungsten wire** of the lamps; covered by **ruby glass**, 6-7 mm thick, 500m<sup>2</sup> used. Contains **selenium**.

**Se** In the bright sunlight the red color of the stars would appear black. To avoid that engineers used to add gold to get the necessary ruby color. But selenium is cheaper and gives a deeper color.

**Spasskaya Tower Star**  
*You had a chance to see it in the Red Square*

**Au** **Gilt**. 40 micron thin. 11 kilograms of gold was used to cover the frame of all stars.

**XYZ** 3,75m long (end-to-end). Wind pressure up to 200 kgs/m<sup>2</sup>.

**W** Lamps. 5 kW. Each has 2 paralleled **tungsten** wires to backup if one burns out.

**Cr** **Steel** backbone in the shape of a multi-faceted pyramid. Framework: **stainless steel**.

**Si** Star arms: lower density **glass** at the ends to scatter light. Initially there was an idea to put several lamps inside the star, but it was finally given up, so the star structure helps scatter light better and the lamp itself is surrounded by many glass prisms.

~ To safeguard the stars against overheating there's a special vent system with **air** filtering and two fans, one of which is a stand-by.

\* Self-contained power protects from power cut-off.

# What we thought it would be and what it really is

Catalyzer interviewed IChO guests about the hosting country.

**Which thing is extremely necessary to be taken to Russia? (number of answers)**



umbrella – 7



warm sweater – 5



passport – 4



dictionary – 2



map – 2



teddy bear – 2



gumboots – 1



repellent – 1



calculator – 1



spicy Korean food – 1



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## Contacts

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