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International Chemistry Olympiads

International Chemistry Olympiads (IChO) are chemistry competitions made for high school students provided they are not yet 20 years old, and not registered in a tertiary institution. IChO are organized each year in a different country and last about one week. There are two sorts of exams, a theoretical examination and some tests in the lab. Both last usually 5 hours. For each part of the competition, the students get points according to a grading scheme. At the end, the points are added, and the best are receiving gold, silver or bronze medals. Each country may send four students, that they select with their proper procedure during the year preceding the Olympiad.

The last IChO happened in Thailand 2017, Prague 2018 and Paris 2019. In 2020 it should have been done in Istanbul. But the competition was restricted to a theoretical one and it had to be done online because of the Corona-virus pandemic.

The first Olympiad took place in Prague 1968, during the famous Prague spring, where Czechoslovakia tried to become independent from USSR. It was organized by teachers from the three countries Poland, Czechoslovakia and Hungary, in an attempt to create a local activity in the Eastern Bloc without USSR. This was a great success and it was repeated in 1969 in Poland. But the Russians heard about this “unfriendly” organization, and Moscow decided to cancel this competition in 1970. But they changed their minds in 1971 and created an Olympiad in Leningrad in 1971. The other countries from the Eastern Bloc were invited, namely also Rumania, Bulgaria and Eastern Germany. It worked well. In the following years, these countries took turns in setting up its own International Chemical Olympiad at home. In 1979, it was Rumania’s turn. At this time, Rumania was trying to take independent initiatives. So, they decided to invite neutral nations like Sweden, Switzerland and Austria. Delegates from Sweden and Austria came to Bucharest, but they were not specially trained, and they finished at the bottom of the list. It was a triumph for the Eastern Bloc. Well! They came again on next years with trained students and started to get medals. Then, gradually, all countries from Europe were invited and took part. Switzerland took some years to react, because all invitations were sent to the national Ministries of education. And of course, there is no such a minister in Switzerland. Anyway, the first Swiss Olympic team took part to IChO in 1987. Presently there are about 80 countries from all over the world.

Presently the Swiss selection process is organized in three rounds. The first round is a series of multiple-choice questions available on Internet during the autumn of the preceding year. The interested students may fill it at school or at home. The fifty best results are invited to take part to the 2nd round: a national exam happening in January in Bern University. This exam is made of a series of problems to be solved on paper by the 50 participants. At the end of this exam, the sixteen best candidates are selected and invited to go on to the 3rd round. The 3rd round occurs at the end of the Easter week. During this week the sixteen selected candidates are invited at ETHZ to adapt their knowledge to the Olympic standards as defined by the organizing country. Theory courses in the morning and lab work in the afternoon. On last day, they have 4 hours written exam and 3 hours lab exercise, the

result of which determines the four best candidates, who will be the Swiss team at the IChO.

Up to now, Switzerland has taken part to all IChO. After 33 years of participation, we can take stock of this long story. As a general assessment, our country has obtained 2 gold medals, 5 silver medals, and 27 bronze medals. This is on average one bronze medal per year, if the first years are not taken into account. Despite these mixed results, the four members of the Swiss teams keep the best memory of their training and participation to the IChO. Even those who were not chosen in the final team were enthusiastic about the possibility offered to develop their faculties about chemistry. Usually the selected candidates are among the best of their classes, and they often practice chemistry at home in their own labs. They usually have studied chemistry alone by reading books at home. They get bored in their usual classes. Once being allowed to practice advanced chemistry with pairs, they feel happy in the Olympic labs.



The Swiss delegation at the 2019 International Chemistry Olympiad. The mentors are in black, and the students are in white shirts. From left to right: Alain Pfammatter, Matthieu Mottet, Kevin Denz, Daniel Gardini, Jasmin Frei, Patrik Willi, Lukas Lüthy, Moreno Inauen.
Source: Schweizer Chemie-Olympiade (science.olympiad.ch)

I remember once having heard a student proposing to use a derivative of naphthalene as indicator. When I told him that I did not have this substance in the lab, he answered: Well! Why not synthesize it with naphthol and sulfuric acid. At 180°C, the substitution will be in alpha position. He tried and unfortunately obtained a dark mixture of probably several isomers. Instead of losing time for purifying it, he used it so. Well at the equivalence point, the change of color was from a sort of gray to another greyish tint. He was enthusiastic! He had succeeded!

The year 2023 will be an important step for the Swiss participation at the IChO. In 2023, our country will organize an International Chemistry Olympiad at ETHZ in Zurich. This requires a huge organization. We will have to host about 300 students from about 75 countries for 8 days, with their mentors, at least two per country. We will have to cover all their expenses and find one guide per country who knows both our country and the language of the invited country. The budget will be higher than 2 Mio. We will also need voluntary people to help accompany those people to the restaurants, to the buses, to the labs and to their rooms. If you feel ready to spend a couple of days in July 2023, do not hesitate to get in touch with us, at the following address : chemistry@olympiad.ch.

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Swiss participation to the IChO
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