

ACHIEVEMENTS OF THE MACEDONIAN OLYMPIAD TEAM AT THE INTERNATIONAL CHEMISTRY OLYMPIAD

The International Chemistry Olympiad (IChO) is an annual competition that gathers the world's most talented high school students in chemistry [1]. Nations from around the world send their best students in a team of four together with their mentors to take part in the most prestigious contest in this field. Every student from the team competes individually and the goal is to complete the five hours long laboratory practical and also the five hour theoretical examination (Fig. 1) successfully, as good as they can, scoring as many points as they can.

According to IChO, the idea of the competition is to stimulate students' interest in chemistry through independent and creative problem solving in the field of chemistry [3]. It also promotes international contacts, friendships between young scientific workers of different nationalities, cooperation among students, and exchange of pedagogical and scientific experience. But these are not the only benefits of this gathering. As a positive "side effect" is the development of social skills among the participants, building understanding and tolerance, valuing the diversity, experiencing the different cultures and styles, and so on. Mentors benefit as well. The personal contacts are of key value for further scientific collaboration between them and also collaboration for further actions within IChO.

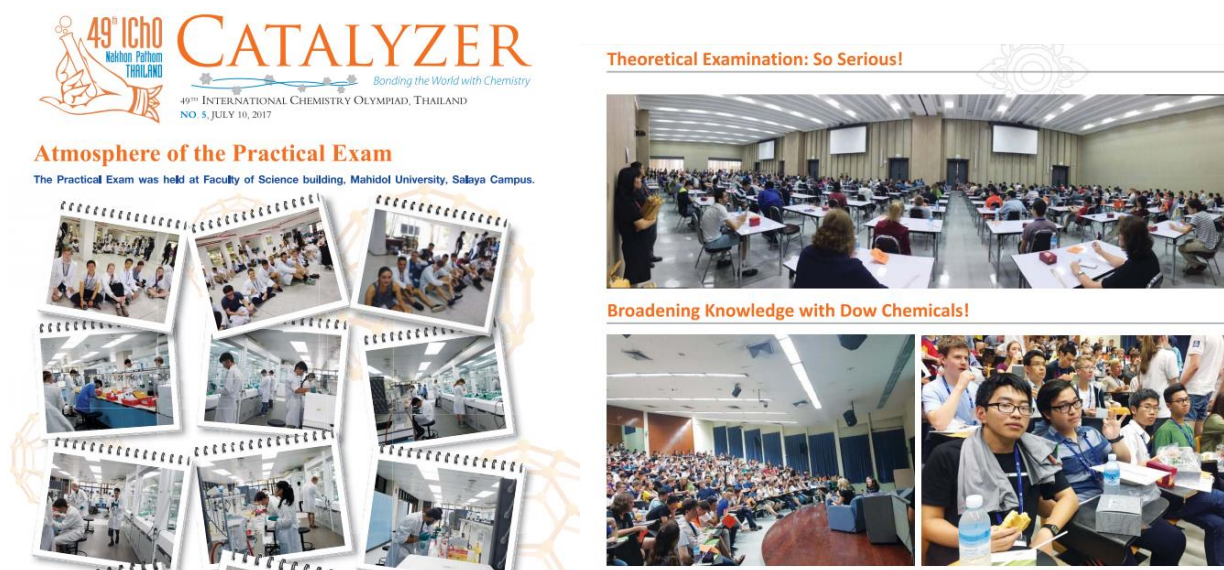


Fig. 1. Cover of the daily journal entitled "Catalyzer" regarding the day by day activities during IChO. **a)** Atmosphere during the practical exam at IChO-2017 and **b)** Atmosphere during the theoretical exam at IChO-2017 [4].

Starting from 2014, The Society of Chemists and Technologists of Macedonia (SCTM) took over the organization of the state competitions in Chemistry in the Republic of Macedonia for high school students [5]. SCTM got the accreditation by the government to organize the national competitions (local, regional and national). Since then, the concept of the examination changed and the goal is to adapt the system according to the standards accepted by the IChO. The division for Education in Chemistry in the SCTM is responsible for preparing the exams.

The Macedonian team has been participating at the IChO in the last 5 years. SCTM has the accreditation not only to organize the national chemistry competition but to select and train the best students for participation in IChO. The Olympiad can be seen as a measure of the success and the achievements of one nation in the field of chemical education and its position on the global scale. The selection system and then the team training is one of the key elements for achieving good results at international competitions.

According to the regulations of SCTM, the selection for the national team is based on the achievements of the students in the national competition. The 30 best high school students are invited for the pre-preparatory training at a higher level resembling the IChO competition and 10 out of them are chosen for the final selection that would give the team of four participants that would have the honor to represent the country at the IChO.

Republic of Macedonia has modest experience concerning the participation at the international level even though as part of Yugoslavia, until 1991 it participated on the federal level and as a part of the Yugoslavian team at the IChO. Even though our experience is limited and taking into consideration the population of the Republic of Macedonia, the Macedonian team managed to achieve very good results so far. At IChO 2017, high school student Filip Trajkovski got a bronze medal, making him the ever first Macedonian to achieve this goal (Fig. 2).



Fig.2. Award ceremony at Mahidol University, Nakhon Pathom, Thailand

The 49th International Chemistry Olympiad took place in Nakhon Pathom near Bangkok, Thailand from 6th to 15th of July 2017, under patronage of Professor Dr. Her Royal Highness Princess Chulabhorn. In this event, 76 countries participated and a total number of 297 students were welcomed at the Mahidol University. According to the statistics 76 head mentors, 75 mentors, 58 observers and 24 guests from the 76 countries participated, which is by far the largest number of participants in the history of the IChO and at the same time the largest number of countries that were enrolled in the Olympiad [4].

The Macedonian team consisted of 4 students and 2 mentors (Fig. 3) [5]:

- Filip Trajkovski, student at 4th year in the City's High School "Rade Jovchevski Korchagin" in Skopje,
- Antonio Andonovski, student at 3th year in the City's High School "Rade Jovchevski Korchagin" in Skopje,
- Magdalena Zlatanova, student at 3th year in the Private High School "Yahya Kemal" in Strumitsa,
- Edita Bitikji, student at 4th year in the Private High School "Yahya Kemal" in Skopje,
- Assistant professor Miha Bukleski, head mentor, Institute of Chemistry, Faculty of Natural Sciences and Mathematics in Skopje, and member of SCTM

- Full time professor Slobotka Aleksovska, mentor, Institute of Chemistry, Faculty of Natural Sciences and Mathematics in Skopje, member of SCTM.



Fig. 3. The Macedonian team together with the local leader. From left to right: the local leader, professor Slobotka Aleksovska, Antonio Andonovski – student, Magdalena Zlatanova – student, Filip Trajkovski – student (the medal winner), Edita Bitikji – student, assistant professor Miha Bukleski.

Over the years of participation, the ranking of the Macedonian students improved, at first slightly but in the last year significantly (Fig. 4) [6]. The improvement can be seen especially after the SCTM took over the organization in 2014 of the competition for high school students and when the members of the SCTM and professors at the Institute of Chemistry got involved in preparing the Olympiad team for IChO-2015.

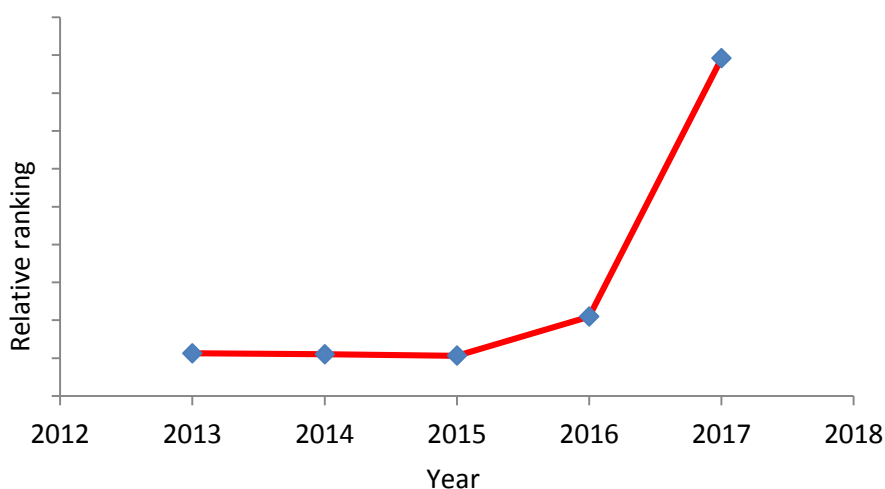


Fig. 4. Best single ranking improvement over the years of the student with highest score scaled to the number of participants. SCTM took over the organization for IChO in 2015.

Even though the funds for organizing the training and attending the IChO are limited (and sometimes non-existing) and the training is driven only by the enthusiasm of the professors included in the process, the progress is evident and the whole team hopes for improvements in the near future.

References:

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