

MACEDONIAN OLYMPIC TEAM WITH TOTAL OF THREE BRONZE MEDALS IN THE INTERNATIONAL YEAR OF THE PERIODIC TABLE

As already known, 2019 was proclaimed as International Year of the Periodic Table - IYPT [1]. The activities concerning the chemistry competitions were categorized as events of importance contributing to the jubilee of 150th anniversary of the Mendeleev Periodic Table. Both the International Mendeleev Olympiad – IMO and the International Chemistry Olympiad – IChO, as two most prestigious chemistry olympiads, were dedicated to this jubilee [2]. That was the reason why this years' Mendeleev Olympiad took place in Saint Petersburg, the city where Dmitri Ivanovich Mendeleev lived and worked [3]. On the other hand, the 51st IChO was held in Paris, home to the UNESCO headquarters where the decision for proclaiming 2019 as IYPT was made.

The IMO was all about the 150th anniversary. Even the logo was designed accordingly, as shown on Fig. 1a. However, not only the IMO logo was inspired by this anniversary. The Periodic Table was an inspiration to the “graphic design students” from France to design the logo for the 53rd IChO (Fig. 1b.). Unaware of the IYPT the designers have stated: “The letters of the framed acronym remind us of the Periodic Table of Mendeleev, one of the fundamental pillars of chemistry” [4]. Taking this into consideration, the impact that the periodic table has on all of us both chemists or non-chemists, is more than obvious.



Fig. 1. a) The logo for the 53rd International Mendeleev Olympiad illustrating the 150th anniversary of Mendeleev Periodic Table; **b)** The logo for the 51st International Chemistry Olympiad inspired by the Mendeleev Table.

IMO and IChO are different in many ways, but both value and grade the knowledge and experimental skills of high school students. IMO has greater tradition since it's three years older than the IChO and started as all union Olympiad in the Soviet era, but continued after the fall of the Soviet Union and became international. This year, 29 countries took part in the IMO, against the 22 in 2018. The first country that competed at IMO and was not part of the former Eastern Bloc was France in the year of 2012.

All major competitions have great impact on the students. They shape not only the students careers but also the way they think, reason, behave... their lifestyle. As one former participant would say: “My IChO experience contributed two critical things to my career decision. The first was that it introduced me to a wider community engaged in chemistry across the globe. Equally important, the IChO introduced me to a broader intellectual vista of chemistry...” [5].

Participation at the International Mendeleev Olympiad – IMO

Macedonia started to participate at IMO in 2006, but the eligibility about the participation was sharply questioned by the organizer since the delegates from the Macedonian team could not confirm the way the students were selected. This problem was sorted out in 2013 when the Society of Chemists and Technologists of Macedonia (SCTM) and its division for Education in Chemistry got the accreditation by the Ministry of Education and Science of the Republic of Macedonia to organize the state competitions and to assemble the Macedonian team that will represent the country at international chemistry competitions. Since 2013, Macedonia did not send team at the IMO due to financial difficulties. All the efforts to provide finances were towards the IChO as the priority Olympiad. Encouraged by the success we had at the 49th and 50th IChO, the members of the division in Education agreed to proceed with the application to participate to the 53rd IMO. The IYPT was a reason plus why to participate at IMO in Petersburg.

After 5 years break, Macedonia is back on the Mendeleev stage, this time with SCTM as an organization standing behind the Olympiad team. The hard work, preparations and the hours spent in the laboratory paid off. The selected team of 4 students and 1 mentor managed to win a bronze medal at this competition. The winner was Stefan Damčevski, and the team consisted of (Fig. 2):

- Stefan Stojković, student at 4th year in the City's High School "Rade Jovchevski Korchagin" in Skopje;
- Stefan Damčevski, student at 4th year in the Private High School "Yahya Kemal" in Struga;
- Mihail Trajkov, student at 2th year in the Municipal High School "Dimitrija Čupovski" in Veles;
- Rufija Idrizovska, student at 4th year in the Private High School "Yahya Kemal" in Gostivar;
- Assistant professor Miha Bukleski, mentor, Institute of Chemistry, Faculty of Natural Sciences and Mathematics in Skopje, member of SCTM.



Fig. 2. The Macedonian team at the IMO. From left to right: Stefan Stojković, Rufija Idrizovska, Stefan Damčevski, Mihail Trajkov and the mentor Miha Bukleski

The awards were presented at Konstantinovskiy Palace in Petersburg by the organizers (Fig. 3) followed by a visit to the Palace and accompanied by great performance. According to the statistics [6] in 87 % of the cases, the students that win medal at the IMO, always win medal at the IChO as well. Our team proved that as well.



Fig. 3. Award ceremony at the Konstantinovsky Palace. **a)** Stefan Damčevski (in the middle) being awarded by the organizers, **b)** The diploma together with the bronze medal.

Participation at the International Chemistry Olympiad – IChO

This is the fifth participation of the Olympiad team since SCTM took over the lead at the IChO. After the hard work and preparations all year round, the success was inevitable. Since 2017, just after two years of participation, the Macedonian team and Filip Trajkovski managed to win a bronze medal – first one ever for Macedonia at the IChO [7,8]. The following year the overall result was improved. In 2018, two bronze medals were won. One for Antonio Andonovski and the other one for Stefan Damčevski [9]. This year, the success was repeated. Two bronze medals, this time for Stefan Stojković and again for the last year bronze medalist Stefan Damčevski were gained.

This year, as a result of the participation to the IMO, two selections were organized by the SCTM in order to complete the team for the IMO and IChO separately. Since the competitions differ, the urge of conducting two different selections was necessary. The second selection meant for the IChO was more focused on the syllabus offered by the 2019 IChO organizers. In this case, one of the students that qualified for Mendeleev competition (Mihail Trajkov) didn't get in IChO team. Instead of him, Aleksandar Trajkovski student at 3th year in the Municipal High School "Krste Petkov Misirkov" in Demir Hisar had a chance to participate. According to the IChO regulations, two mentors accompany the students, so associate professor Nataša Ristovska, also from the Institute of Chemistry accompanied Miha Bukleski (Fig. 4).



Fig. 4. The Macedonian team at the IChO after the award ceremony. From left to right: associate professor Nataša Ristovska, Stefan Stojković (medal winner), Aleksandar Trajkovski, Rufija Idrizovska, Stefan Damčevski (medal winner), assistant professor Miha Bukleski.

At the 51st IChO, 80 countries participated with 309 students, 160 mentors and head mentors, 109 observers and guests and 273 members of the organization. So far, this has been the Olympiad with the most participants and participating countries.

According to the achievements in the IChO for the last 3 years, it is obvious that the performance of the team is improving. That can be seen explicitly not only by the individual results but also by the cumulative performance of all members (Fig. 5).

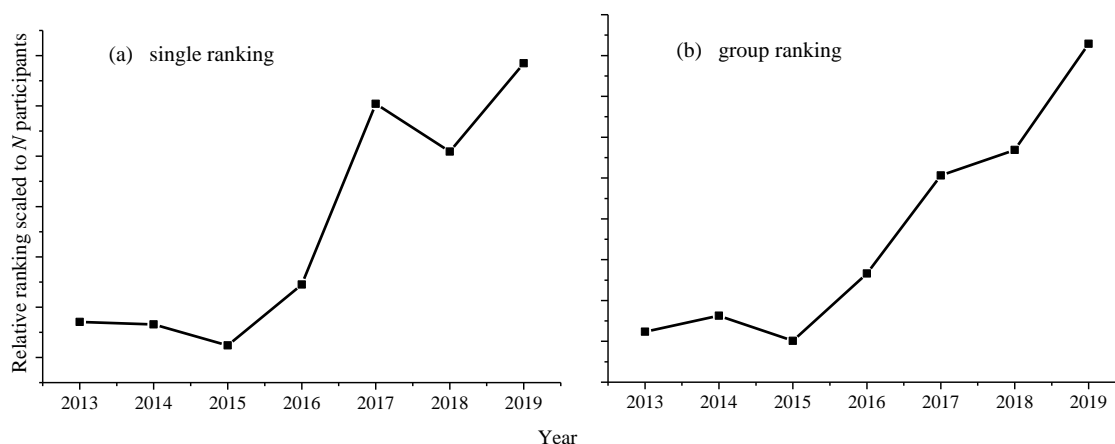


Fig. 5. The best relative ranking improvement over the years of the **(a)** student with the highest score and **(b)** entire team, scaled to the number of participants.

Conclusion

Is there a better way to conclude the IYPT rather than winning a medal at the Mendeleev Olympiad in Saint Petersburg? The success was completed with additional two medals at IChO. The three medals won in 2019 speak loud enough about the improved quality of the preparation of the Macedonian team. It is important that all members of the team improve the ranking and performance at the Olympiad. It is the first Olympiad where all students from the team successfully completed the practical problems. The statistics show that the students scored 85 % from the total points in the practical tasks. That is something that has not been achieved so far.

References:

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