DEVELOPMENTS IN CHEMICAL EDUCATION ON THE 87th ANNIVERSARY OF SYSTEMATIC EDUCATION IN TURKEY

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Abstract
In this paper, the chemical education in Turkey has been analyzed systematically from the start in 1917 up to today from the historical point of view. In addition, the difficulties faced in the evolvement of systematic chemical education and science in Turkey has also been emphasized.

History of Chemical Education in Turkey
Systematic Chemical Education started in the Institute of Chemistry in the Science Faculty at Istanbul University (Darülfünün) in 1917. The year 2004 is the 87th anniversary of this joyous occasion. Having completed 87 years, we consider it quite necessary to evaluate the developments, which have taken place within 87 years in the field of chemical education.

Until 1917, chemistry was either a subsidiary course or a course offering a general knowledge of science to students. In the period until 1899, chemistry had to be examined alongside medicine. We encounter a separate chemistry course in the curriculum of a premed school, opened in 1827, 12 years before Reformation in the Ottoman Empire (Tanzimat) , and afterwards in the curriculum of the School of Medicine.

As it can be clearly observed, chemistry had been a subsidiary science for Medicine for years. In addition to medical school, we should also mention the names of the other institutions which taught chemistry systematically with a European approach, such as Galatasaray Highschool (1868), Darüşşafaka (1873) and the Military College (1873). Up to this point, we have tried to point out the institutions that offered chemistry as a subsidiary science and as a part of general knowledge rather than as a separate academic and professional course. Up to 1950, Istanbul University's Department of Chemistry in the Faculty of Science had been the only institution that trained qualified chemists. Consequently, we have to mention the origin and the development of this institute in order to understand the improvement of chemical education in the Turkish Republic. With the exception of Muslim Theological Schools (Medrese), the study of positive sciences begun in the College of Mathematics (Hendesehane, 1734), the Imperial Engineering School (Mühendishanei Bahrii Hümayun ,1773) and Imperial Land Forces School (Mühendishanei Berrii Hümayun ,1795). Besides from these schools, the idea of starting higher science education was initiated by the Great Reşit Pasha. In order to offer higher science education, he suggested establishing a University (Darülfünün ,1844), however, this idea was postponed for a short time. Eventually, it was decided to begin chemistry education in University (Darülfünün) with the help of the public conferences of Keçecizade Fuat Pasha in the building of University in Ayasofya. Thus, the first lectures of Physical and Natural sciences began in 1862, and we can easily say that this was the foundation of today's Faculty of Science at Istanbul University. Derviş Pasha gave the first lecture, which was on electricity in December 1862. Later on he went to Paris and had stayed there for years. Having returned, he continued giving lectures on physics and chemistry. Throughout this period, ample laboratory equipment and supplies had been procured and physics and chemistry laboratories had been established. But unfortunately, they were all lost during the fire of Ayasofya. Hoca Tahsin Efendi was appointed as the director of Darülfünün Osmani Institute that

was opened in 1869. However, the life of the institute was ephemeral as well, and it was again closed due to a conservative point of view. Before it was closed, a chemistry course that was about water and a course on chemical heat and equilibrium had been lectured by Hoca Tahsin Efendi.

In 1899, Istanbul University (Darülfünunu) Şahanesi was founded. At the beginning, there were two branches of this institute: Theological and Literatue (Ulumu Şeriye and Edebiye) as well as Mathematics and Natural Sciences (Ulumu Riyaziye and Tabiiye). Mathematics and Natural Sciences were equal to today's Faculty of Sciences, and in this branch Naum Efendi taught chemistry courses. After the 1908 Revolution (Inkilap), Istanbul University was moved to Zeynep Hanım mansion, and the number of branches was increased from two to five. The Faculty of Sciences was again formed by two branches, but they were more developed than the first ones. Germany was the ally of Ottoman Empire during the World War I, and the Ottoman Empire decided to make a reform in the University by inviting some qualified faculty members from Germany. Three of them were in the field of chemistry. These were Professors Arndt, Von Hösch and Fester. These professors separated Chemistry from Biology as separate department, and established Chemistry Specialized Group. Besides that, they restored a building in Yerebatan, and brought supplies from Germany. Upon establishment of the Chemistry Specialized Group they also prepared its course syllabus in order to train industrial chemists. The program was: [1]

1. & 2. Semesters: Mathematics (4 hours), Physics (3 hours), Inorganic Chemistry (Arndt – 4 hours)
3. & 4. Semesters: Organic Chemistry (Von Hösch – 4 hours), Analytical Chemistry (1 hour), Geology (3 hours)

5. & 6. Semesters: Biochemistry (2 hours), Industrial Chemistry (Fester – 3 hours), Painting Techniques with Painting Materials (1 hour)

7. & 8. Semesters: Food Chemistry (1 hour), Selected Topics in Industrial Chemistry (theory and practice)

The laboratories of Inorganic, Organic and Industrial Chemistry were always open during weekdays between 8 am. and 6 pm. and the labs were always accessible to students.

Having completed all the preparations, the formal education in chemistry started in 1917. At the beginning there were only three students (Kasım, Kutsi and Cavit) who were transferred from the biology to the chemistry department. These students were exempted from the first year, because they had already taken some of the courses from the biology department. After three years in chemistry, they graduated as the first chemists of Turkey in 1920.

Afterwards, two young students were registered to the first year of the institute: Ord. Prof. İlhami Civaoğlu and Muammer Eriş (General Manager of Isbank). Later, six more students from School of Education joined the institute. They were Aliye, Hasibe, Meliha, Ubeyde, Kamil and Necati. Finally, they all graduated as chemists in 1921. Three German Professors (Arndt, Von Hösch, Fester) in the institute returned to Germany after the truce in World War I. By their return, the academic staff of the institute had become as follows:

Inorganic and Analytical Chemistry: Prof. Ligor Tanakidis
Organic Chemistry: Prof Ömer Şevket
Biochemistry: Prof Dr. Mazhar Cevat
Industrial Chemistry: Mr. Suzi

As a result of cultural agreement with France, a lecturer named Prof. Michel Failben came and taught physical chemistry for the first time in Turkey in 1926. Hence, in 1927 faculty members of Chemistry Institute was:

Prof. Ligor: Inorganic and Analytical Chemistry
Prof. Ömer Şevki: Organic Chemistry
Failben: physical chemistry

Prof. Cevat Mazhar: Biochemistry
Prof. Nazmi Asaf: Industrial Chemistry

In 1930, Prof. Failben had returned to France, and Prof. G. Valensi came. He was the only Chemistry professor who stayed in the institute during the 1933 University Reform. He returned to France in 1934. After the 1933 University Reform, the department of "Chemical Engineering" was opened by adding some extra courses to the curriculum of the regular program. The students who graduated from Chemistry Institute before 1937, were called chemists, and after the year 1937 the graduate students got the degree of Chemical Engineering.[2]

Up to 1950, Istanbul University's historical Chemistry Institute of Science Faculty educated all the chemists and chemical engineers for Turkey. Today, there are 53 state Universities and 23 Foundation Universities. The chemistry departments of these universities train chemists in the undergraduate program, and chemical engineers in chemical engineers departments. Moreover, students are trained as chemistry teachers in the faculties of education.

Chemistry has been improving very rapidly since chemistry education started in Turkey. The education started with six academic staff and three students in the Chemistry Institute in 1917. These students graduated as the first chemists of Turkey in 1920. Today, there are thousands of students and over 3000 teachers in the departments of Chemistry of 76 universities, and every year hundreds of students graduate as chemists from these universities.

As for the Chemical Industry, there was not such an industry before the Turkish Republic. There was only the production of some materials such as rose oil, soap, oil and gun powder. Everything was imported from other countries. However, today there is a big Chemical Industry in Turkey.

The entire improvement of a country and the secret of turning into a modern industrial society depend on a good and reliable education system, and qualified scientists and technological employees who are successful in every field. The 'human' factor is the only factor that can materialize the expectations of the 21st century. Technology has been developing rapidly. It is an inevitable necessity that Turkish people should be trained according to the necessities of the 21st century, and education should be formed along with this matter. Well how should this education be?

Chemical industry has a dynamic nature; hence it has been renewing constantly. A modern chemical industry is the one that can renew itself continually, produce new materials, present the best solutions in the best conditions, and besides it should have strong driving force for competition. For this reason, it is necessary to train the professionals who aim at achieving these goals. [3]

The 21st century is the age of science and technology. Therefore, the human factor should be trained as creative and productive. In our universities, it is necessary to revise the programs of Chemical Education according to the needs of 21st century, and Supreme Higher Education Council (YÖK) has big missions and responsibilities on this matter.

References

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