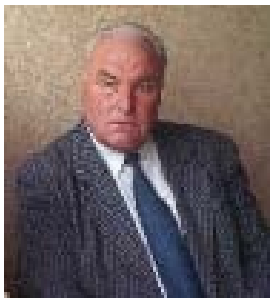
Bulgarian Chemical Communications, Volume 49, Number 1 (pp. 9 – 10) 2015

Professor Christo Boyadjiev's 80 years anniversary, 60 years in science



Professor Christo Boyadjiev was born on August 17, 1936. He graduated Higher Institute of Chemical Technology (Sofia) in 1960.

His overall inventive career is inextricably linked with the Institute of Chemical Engineering and its predecessors – the Mass Transfer Processes Department in the Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences (1963-1972) and the Central Laboratory of Theoretical Fondations of Chemical Engineering (1972-1986).

In 1962 the young then Christo Boyadjiev after a competition starts working as a research associate in the Mass Transfer Processes Department at the Institute of General and Inorganic Chemistry. In 1963 he passed specialization in the Institute of Electrochemistry in the Soviet Academy of Sciences at the famous professor Benjamin Levich. He was highly motivated by his contact with such world-renowned scientist as Professor Levich from the school of Nobel laureate Academic Lev Landau and conducted researches on "The Effect of the Surfactants on the Hydrodynamics and Mass Transfer". In 1968 he defended his PhD dissertation entitled "The Influence of Surfactants on the Hydrodynamics and Mass Transfer in Laminar Films" at the Moscow Institute of Chemical Machinery Constructions.

The laid foundations for joint theoretical and experimental research with Prof. Levich and later with Prof. Krylov on "Hydrodynamics and mass transfer in liquid film flowss" puts strong reflections on Prof. Boyadjiev's scientific researches. He continues them with his Ph.D. students. In 1978 he defended a dissertation on the same topic and received Doctor of Technical Sciences degree. The results are summarized in 39 scientific publications and two monographies "Mass Transfer in Liquid Film Flows", (Chr. Boyadjiev, V. Beschkov, Publ. House Bulg. Acad. Sci., Sofia, 1984) and "Массоперенос в движущихся пленках жидкости" (Хр. Бояджиев, В. Бешков, Изд. "Мир", Москва, 1988).

Along with these studies Prof. Boyadjiev, along with Prof. Krylov began intensive research on non-linear effects in mass transfer and became one of the founders of the non-linear mass transfer theory. This theory is an outstanding contribution to the development of the mass transfer theory. It gives response of the nature of the observed deviations of the experimental data from the predictions of the linear mass transfer theory and explains their mechanism through the induction of secondary flows which are violating the hydrodynamic stability on the phase boundaries in gases and liquids and are changing the mass transfer kinetics. Unfortunately the early death of Professor Krylov, interrupts their joint work, but the results were published in a joint monography "Нелинейный массоперенос", (В. С. Крылов, Хр. Бояджиев, Изд. Институт теплофизики СОРАН, Новосибирск, 1996). Those studies however are continued by Prof. Boyadjiev and lead to the creation of a comprehensive non-linear mass transfer and hydrodynamic stability theory, presented in the monography "Non-Linear Mass Transfer and Hydrodynamic Stability", (Chr. B. Boyadjiev, V. N. Babak, ELSEVIER, 2000).

With the creation of the Central Laboratory on Theoretical Basis of Chemical Engineering and later the Institute of Chemical Engineering are created laboratories "Modeling and Optimization" and "Chemical Process System Engineering", whose longtime leader was Prof. Boyadjiev. This new "Processes systems engineering" research field begin to develop in Bulgaria almost parallel with his development in such leading countries like USA, UK, Switzerland and others. Methods for optimal design and / or management for modeling and simulation of chemical-technological systems, methods for energy integration and reconstruction of technological systems with continuous and batch processes, methods for multi-product and multi-process systems optimization are developed by collaborators of the laboratory, under the guidance of prof. Boyadjiev. Under his guidance are published over 40 scientific works. These basic studies are summarized in the monography "Основи на моделирането и симулирането в инженерната химия и химичната технология", (Хр. Бояджиев, ИИХ-БАН, София, 1993). Prof. Boyadjiev is a pioneer of Chemical Process Systems Engineering in Bulgaria. He set up his own school and his students taken their own path, to this day, are continuing the oriented research activities and are training the next generations young scientists.

In his 60 years creative path, Prof. Boyadjiev strived to use a new scientific method or approach every 4-5 years. Thus in his publications a wide range of theoretical methods for modeling and simulation of processes and systems in the chemical industry are used. An overview of these methods and their application is presented in the monography, "Theoretical Chemical Engineering. Modeling and simulation ", (Christo Boyadjiev, SPRINGER - Verlag, Berlin Heidelberg, 2010). That monography presents methods for simple and complex processes modeling, methods of theoretical quantitative and qualitative models analysis, methods for analysis the stability of the models, methods for parameters identification in models and more.

His latest monography "Modeling of Column Apparatus Processes" presenting new methods for modeling of column apparatus is published in 2016, (Christo Boyadjiev, Maria Doichinova, Boyan Boyadjiev, Petya Popova-Krumova,, SPRINGER - Verlag, Berlin Heidelberg , 2016).

For his overall contribution to the development of the chemical engineering science in Bulgaria, Professor Christo Boyadjiev was awarded with the Medal of Cyril and Methodius I class and for its contribution to the development of scientific research between Bulgaria and Russia was awarded with the Medal Mikhailo Lomonosov by the Russian Federation.

Of course much more can be said about the scientific achievements of Professor Christo Boyadjiev, but we will finish with the words:

Happy anniversary!

Prof. Natasha Bancheva