

## The 80th birthday of Professor Ona Galdikienė

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On February 11, 2005, at a meeting at the Institute of Chemistry, Vilnius, the community of Lithuanian electrochemists marked the 80th birthday of Professor Ona Galdikienė who passed away almost 10 years ago. Professor Ona Galdikienė was one of the most outstanding representatives of electrochemistry in Lithuania and an Individual with passion for life and work, coupled with logical thought, self-belief and energy.

Ona (Repdytė) Galdikienė was born in Telšiai, Lithuania, on February 11, 1925. Her parents were physicians. Furthermore, her father was known to be good at mathematics. She was grown up in the family where not only medicine but also sciences were highly respected. Ona entered the medical course of a midwifery school at Kaunas, completing it in 1944. Her first job was in the TB Centre in Telšiai as a nurse. Shortly afterwards, in 1945, Ona moved to Vilnius where she began studying chemistry at Department of Chemistry of Vilnius University. A 1950 graduate of this University, she started a candidate (now Ph. D.) study in electrochemistry at the Institute of Chemistry and Chemical Technology (since 1992 the Institute of Chemistry) under the guidance of Professor Juozas Matulis, for whom she always had great respect. After having defended her candidate work on the overvoltage of hydrogen evolution at aluminum in 1953, Ona Galdikienė continued her own scientific work in the

area of electrochemistry at the Institute of Chemistry where she spent her whole life as an electrochemist. She took up positions of senior research associate in Departments of Electrochemistry, of Physical Chemistry and of Functional Galvanotechnics (31 10 1953 till 31 12 1978), Head of Department of Investigation of Corrosion Processes (01 01 1979 till 31 01 1990) and then chief research associate (01 02 1990 until her death on May 25, 1995).

At the beginning of her independent scientific career Ona Galdikienė investigated the mechanism and kinetics of electrode reactions occurring at the discharge and ionization of nickel, copper and zinc as the main metals in galvanotechnics and the electrochemical behaviour of numerous inorganic and organic additives to the plating solutions. At this time, her research work was especially focused on electrode processes involving a sequence of reactions during the electrolysis of nickel(II) solutions and also on the specific adsorption of such additives as 2-butyne-1,4-diol, saccharin and thiourea at nickel electrode. In this connection, the experiments carried out by Ona Galdikienė left no room for doubt as for the discharge of hydrogen ions as a primary reaction with beginning the electrolysis of acidic nickel(II) solutions while the deposition of nickel coating is the second reaction occurring onto electrode covered by an adsorbed film consisting of oxygenated nickel(II) compounds. These findings were in contrast to the results obtained until then and were significant not only for the deposition of nickel layers with desired properties, but also helped to explain certain points relating the deposition of other metal coatings. Much of this work was connected with the effect of the additives mentioned above on the nickel deposition process. In particular, she showed that this effect was quite different with regard to the individual reactions taking place during electrolysis of acidic nickel(II) solutions – the hydrogen evolution was accelerated while the discharge of nickel ions was retarded in the presence of additive agents.

Ona Galdikienė made a substantial contribution to the understanding of the role of copper–oxygen compounds sol on the formation of copper deposits in weakly acidic or nearly neutral sulphate solutions containing some brighteners and in additive-free alkaline solutions of copper complexes with ammonia, as well as to the elucidation of the origins of

spontaneous cathodic potential oscillations in alkaline non-cyanide zinc solutions.

The experimental data on the electrochemistry of nickel, copper and zinc obtained by Ona Galdikienė herself and in collaboration with co-workers were described in her doctoral (now Habil. Dr.) thesis defended in 1973.

In the last two decades, Ona Galdikienė also worked on several other topics including tin electrodeposition, copper and tin co-deposition and the corrosion behaviour of zinc coatings pre-covered with conversion films and nickel deposits in various corrosive media. In particular, it was shown that the formation of intermediate tin(II)-oxygen compounds should be taken into account when studying tin deposition from alkaline tin(II) solutions, and that the discharge of tin(II) ions in acidic sulphate solution involves two successive one-electron steps, first charge transfer being the rate-limiting stage. The formation of at least four distinct copper-tin alloy phases was determined depending on the potential region and other experimental conditions. The appearance of anodic inverted waves in the region of cathodic potentials used for deposition of copper-tin alloys was observed in cyclic voltammetry and explained in terms of anodic dissolution of a separate  $\beta$ -phase of tin in a deposited bronze coating.

Two important factors that were to become significant throughout her whole research career are well apparent. First, she had high standards for experimental work and initiated the application of more modern instrumentation. Second, she always saw the possibilities of the many results obtained in the course of fundamental work to be applied in industry. Working broadly in the fields of electrochemistry and corrosion, Ona Galdikienė prepared a well argued review about bright nickel plating processes; she was a leader in preparing and carrying out a program of measures for registration and lessening of metal losses due to corrosion in Lithuania.

Ona Galdikienė and her colleagues developed six original technological processes for nickel, copper, tin and copper-tin alloy electrodeposition. All these processes found a wide use in industry.

For her significant contribution to the fundamental and applied electrochemistry, Ona Galdikienė (together with other colleagues) was awarded the Lithuanian State Prize (1975) and the title of Honoured Scientist (1982). In 1993 she became Professor.

Professor Ona Galdikienė spent her whole academic life at the Institute of Chemistry. At the moment, many of her professional colleagues and friends are still working in the Institute. We always feel lucky to be among her friends. We met her nearly four decades ago when, in 1958, took employment to the Institute. At that time Ona Galdikienė was already a recognized scientist while both of us were only very young students. Despite this fact and

mainly because of her benevolent behaviour our talks or discussions were from the outset on an open and equal basis. This encourages us to say some additional words about her personality and her image in the Institute.

“Strong character”, “open-minded” and “communicative” are maybe only some of the qualities which, without effort, come to our mind when Professor Ona Galdikienė is to be mentioned. Professor was a good debater, diplomatic in speaking, knew how to dissolve effectively burning questions, including those outside Lithuania. She behaved in a dignified way. She was known to be quick-tempered, but her anger did not last long.

It is not surprising that during the sixties and seventies, when the investigations in fundamental electrochemistry were kept absolutely in men's hands, Ona Galdikienė, being a distinct personality, working hard and therefore quickly becoming an expert in this field, took up a position of a well-known electrochemist whose far-reaching insight allowed her to remain among the most outstanding electrochemists in Lithuania later on as well.

At the same time it is rather surprising that, although her good knowledge of electrochemistry and corrosion was well recognized and her practical skills were high, Ona Galdikienė was not very active in teaching. She personally supervised three and, together with her colleagues, two Ph. D. theses. Most likely such a state of affairs could be partly explained by her very intensive work carried out on her own, her high requirements for experimental work and, last but not least, by certain sharpness in her character. In this context, it seems that a statement like “All women are complex, but this one is more complex than others”, following George Orwell and Professor Jan H. Sluyters, could be applicable.

Professor Ona Galdikienė had her own likings. When a schoolgirl she was captivated by basketball, later by table tennis. In succeeding years she became a keen and successful bridge player.

We are sure that because of her exceptional qualities, friendship in her behaviour with the colleagues and whole personnel of the Institute, her scientific intuition, her passion for life and attempts to be stoical even when she had to overcome a great personal loss, Ona Galdikienė was deservedly named as “Ponia Ona” (meaning something like “Lady Ona” in Lithuanian). We believe that this name is especially apt.

In closing, we would like to thank all those whose warm words in memory of Professor Ona Galdikienė were said at the Meeting and were used here. Her name and her work will be associated with the Lithuanian electrochemical community for generations to come.

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