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IN MEMORIAM

Dedicated to the memory of Prof. DSc Dimitar R. Mehandzhiev (1933-2026)

Dimitar R. Mehandzhiev was born on July 20, 1933, in Sofia. His life and scientific path are a vivid example of dedicated service to science and a lasting contribution to the development of Bulgarian chemistry. He completed his secondary education in 1950 in Sofia, and in 1956 he graduated with honors in Chemistry at the Sofia University "St. Kliment Ohridski", laying the solid foundations of an extremely fruitful scientific career. His first professional steps were in industry - at the Soda Plant in Devnya and the Lead Mining Plant in Kurilo (both in Bulgaria), where he gained valuable practical experience. Since 1960, his life and scientific path were permanently connected with the Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences - the institution to which he dedicated more than four decades of purposeful and inspired work. Here, he went through all stages of scientific growth: in 1968 he defended the degree of PhD and in 1983 - the degree of Doctor of Chemical Sciences (DSc). In 1985 he was elected Senior research associate (Professor). Until 2005 he headed the laboratory "Chemical Problems of Environmental Protection" at the Institute, turning it into one of the leading scientific units in the field of catalysis and environmentally oriented research.

At the very beginning of his scientific activity, Prof. DSc Dimitar Mehandzhiev laid the foundations of the research on magnetic properties of catalysts in Bulgaria. The creation of the first apparatus in our country for measuring the magnetic susceptibility of materials and the discovery of the magneto-catalytic effect in antiferromagnets are among his fundamental contributions with significant international resonance. These studies led to the formation of new conceptual approaches for the targeted selection and design of metal oxide catalysts.

His scientific research is marked by depth, systematicity and originality. A significant part of his works is dedicated to the clarification of the relationship "composition – structure – catalytic activity" in metal oxide catalysts based on 3d-transition metals. He developed thermodynamic models for the stability of oxides, introduced new criteria for the formation of non-stoichiometric phases and for the first time gave a theoretical explanation of a number of experimental dependencies related to the structure and activity of catalysts. He established that during catalytic processes, an active layer with a specific composition and structure is formed on the surface of oxides - a discovery of great importance for understanding catalytic mechanisms.

A significant contribution has also been made by his research on mixed oxides with a spinel structure which provided stabilization of the active phase and increased resistance to catalytic poisons. It has been shown that a number of spinels based on copper, nickel, cobalt and manganese exhibit high activity and selectivity in nitrogen oxide reduction reactions, which contributed to the establishment of effective catalysts based on non-noble metals.

The achievements in the development of ecocatalysis in Bulgaria occupy a special place in his scientific legacy. Prof. DSc Dimitar Mehandzhiev is among the pioneers in this field, and under his leadership non-platinum catalysts for treatment of waste and exhaust gases, as well as innovative metal oxide systems for the oxidation of carbon monoxide at room temperature were developed. New approaches for catalytic oxidation with ozone for the purification of liquid and gaseous media have also been created. The concepts he developed for adsorption and increased reactivity of nitrogen oxides on microporous media are widely recognized and applied.

The scientific activity of Prof. DSc Dimitar Mehandzhiev is also distinguished by the creation of a sustainable scientific school. His scientific assets include over 300 scientific publications, 23 copyright certificates and patents, some of which have been implemented with tangible economic effects, and his works have been cited more than 2000 times. He is co-author of the monographs

"Magnetochemistry of the solid state" and "Catalysis and environmental protection", recognized as significant scientific and educational publications. Under his leadership, 18 dissertations for the Doctor (PhD) degree have been defended, and his students and followers continue to successfully develop the scientific directions he started. Along with his scientific activity, Prof. DSc Dimitar Mehandzhiev also had a significant contribution as a scientific organizer and public figure. In the period 1992–1995 he was Deputy Chairman of the General Assembly of the Bulgarian Academy of Sciences, from 1993 to 2005 he was Deputy Director of the Institute of General and Inorganic Chemistry, and since 1996 - member of the Executive Board of the Bulgarian Academy of Sciences. His authority as a scientist and a personality made him a long-standing member of national expert and attestation bodies. For his exceptional scientific and applied achievements, Prof. DSc Dimitar Mehandzhiev has been awarded numerous awards, including the badge of Honor of the Bulgarian Academy of Sciences, the gold badge "For Contribution to Technical Progress", the title "Honored Inventor", as well as the "Marin Drinov" Order with ribbon. His name occupies a worthy place in international biographical directories of prominent scientists and intellectuals.

Prof. Dr. Anton Naydenov

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