SPECIAL ISSUE DEDICATED TO THE 70TH ANNIVERSARY FROM THE FOUNDATION OF THE FIRST ACADEMIC INSTITUTIONS AND TO THE 55TH FROM THE FOUNDATION OF THE ACADEMY OF SCIENCES OF MOLDOVA

Foundation of the Academy of Sciences of Moldova

On the basis of the decision of the Government of the USSR of March 11, 1946 to organize in Chisinau the Base of scientific researches of the Academy of Sciences of USSR, the Council of Ministries of MSSR and the Bureau of CC of the CP(b) of Moldova adopted on June 12, 1946 the Decision No. 583 "On the creation of the Moldovan Base of scientific researches of the Academy of Sciences of USSR in Chisinau. On June 29 the Presidium of the Academy of Sciences of the USSR approved the structure of the Base, its main directions of research and the governing bodies. Subsequently, in 1949, the Base was transformed in the Moldovan Branch of the Academy of Sciences of USSR. The inaugural act of constitution and opening of the Academy of Sciences of the Moldovan SSR took place on August 2, 1961.

The first President of the Academy of Sciences of Moldova was Prof. Iachim Grosul, Corresponding Member of the Academy of Sciences of USSR, Academician of the ASM, Doctor Habilitate of Historical Sciences (1961-1976), followed by Prof. Alexandru Jucenco, Corresponding Member of the Academy of Sciences of USSR, Academician of the ASM, Doctor Habilitate of Biological Sciences (1977-1989), by Prof. Andrei Andries, Academician of the ASM, Doctor Habilitate of Physical and Mathematical Sciences (1989-2004) and Prof. Gheorghe Duca, Academician of the ASM, Doctor Habilitate of Chemical Sciences (beginning with 2004).

The Institute of Chemistry of the Academy of Sciences of Moldova

The Institute of Chemistry of the ASM was founded in 1959 on the basis of the departments of organic chemistry, of inorganic chemistry and the laboratory of analytical chemistry of the Moldovan Branch of the Academy of Sciences of the USSR.

The cornerstones of scientific directions of the Institute of Chemistry were laid down by famous researchers, members of the Academy of Sciences, founders of scientific schools in Moldova: A.V. Ablov (1905-1978) – School of Coordination Compounds Chemistry; G.V. Lazurievski (1906-1987) – School of Organic and Bioorganic Chemistry, Yu.S. Lealicov (1909-1976), organizer and leader of research related to physical-chemical methods of analysis – School of Polarography.

Later, new scientific schools were created: School of Quantum Chemistry – headed by academician I. Bersuker; School of Organic, Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Compounds – headed by academician P. Vlad; School of Coordination Chemistry, Macrocyclic and Supramolecular Compounds – headed by academician N. Garbalau; School of Ecological Chemistry – headed by academician Gh. Duca, School of Bioinorganic Chemistry – headed by academician C. Turta and Scientific School in the field of Chemistry of Adsorbents – headed by the corresponding member T. Lupascu.

In 2006, the Institute of Chemistry launched the publication (in English) of the peer-reviewed scientific journal ***Chemistry Journal of Moldova. General, Industrial and Ecological Chemistry*** (ChemJMold). Recently, ChemJMold has been included in *Thomson Reuters-Emerging Source Citation Index* (ESCI) based on relevance to a scholarly community, interest to opinion leaders, coverage of emerging fields, and feedback given by Web of Science customers.

Main results

The research direction of the Institute of Chemistry of the ASM is *SYNTHESIS, STRUCTURE AND PROPERTIES OF NEW POLYFUNCTIONAL SUBSTANCES; PROCESSES AND TECHNOLOGIES FOR ENVIRONMENTAL TREATMENT.*

Investigations of the influence of the electronic structure on the nuclei configuration and dynamics were crowned with the discovery entitled „The effect of tunnel cleavage of energetic levels of polyatomic systems in the state of electronic degeneration".

Importantly, there were also developed in the theory and practice of the template synthesis of coordination compounds of transition metals with organic ligands of chelating and macrocyclic type, amongst which compounds of practical utility were marked out.

Original methods were also developed related to the synthesis of new coordination compounds of biometals with polyfunctional ligands, including compounds with significant antitumor antiviral, anti-chlorosis activity, as well as compounds with psychotropic properties.

The scientific school in the chemistry of natural compounds, founded at the institute, is the world leader known in the study of superacidic cyclization of terpenes. The laws of this reaction were established for various classes of terpene compounds (alcohols, their acetates, acids, esters, phenyl sulphones, etc.).

Technologies of the production of activated carbon from vegetable by-products were elaborated to be used for the detoxification of human body, for treatment of waste waters, of surface and ground waters.

Most valuable findings:

✓ Coordination compounds with various useful properties: polynuclear compounds of Cr(III) as molecular magnets, catalysts of technological and biotechnological processes, macrocyclic colorants for plastics and synthetic fibres; new compounds for obtaining extra-pure metals, compounds for ion selective electrodes; agents for anticorrosive coating and protection of metals.

✓ Coordination combinations with anticancer, antiviral, antibacterial, anticoccidial, antidote properties; growth regulators for plants and algae.

✓ Odorant products, aromatizers and biologically active products based on natural terpenes, used in tobacco processing, perfumery, medicine.

✓ Methods of obtaining: organic substances with psycho-stimulating, anticonvulsant, sedative, tranquilizing, antimycotic effects; regulators of cardiac activity; compounds with significant tuberculostatic activity.

✓ Procedures of obtaining and regenerating activated carbons from vegetable waste; medicinal preparations based on activated carbons, catalysts and adsorbents for the purification of ground and surface waters.

✓ New functionalized ionic liquids as renewable catalysts for chemoselective redox processes.

✓ New preparations from grape seeds for medicine, veterinary and agriculture (ENOXIL-M and ENOXIL-A, and a dermatological cream based on Enoxil). In 2010, for the first time in its history, the Institute of Chemistry registered a trademark at the National Register of Trademarks and received a certificate for preparations based on the biologically active substance “ENOXIL”, thus obtaining protection on the territory of the Republic of Moldova for a period of 10 years.

✓ Technologies for removing hydrogen sulphide from ground waters and processing of underground waters from divalent iron and manganese ions.

✓ Green technology for recycling plastic waste so as to make new products.

✓ New compositions to be used as plaster for the interior surface coatings of buildings.

✓ Efficient methods of dosing heavy metals (Pb, Cu, Cd, Fe, Ni, Zn, and Mo) in foodstuffs and environmental objects.

✓ Development and application of optimal compositions of biofuel blends, using physico-chemical modelling.

Corresponding Member, Doctor Habilitate, Professor Tudor LUPASCU,
Director of the Institute of Chemistry of the Academy of Sciences of Moldova