

## Professor Emil Julian Chibowski, Ph.D., D.Sc.

a tribute on his 50<sup>th</sup> year of scientific activity



Emil Julian Chibowski was born on May 14, 1943 in the Podlasie region of the Lublin district. After completing his elementary education, he attended the Secondary Technical School of Chemistry in Lublin and obtained a technical diploma in chemical analysis in 1962. In the same year he enrolled in the chemistry programme at the Faculty of Mathematics, Physics and Chemistry of the Maria Curie-Skłodowska University (UMCS) in Lublin. He received his M.Sc. degree in 1967 and was employed at the Department of Physical Chemistry, Faculty of Chemistry UMCS where he investigated problems of mineral ore beneficiation, especially sulphur ore by flotation method. Since the beginning of his research Emil Chibowski was interested in electrical double layer and electrokinetic phenomena occurring at mineral/solution interfaces. In 1973 he obtained Ph.D. degree in chemistry under the guidance of Professor Andrzej Waksmundzki. The Ph.D. thesis dealt with *“Changes of surface potentials of some minerals in aqueous solutions of electrolytes and surface active substances”*. Later apart the electrochemical phenomena he also started to investigate wetting properties of solid (mineral) surfaces and their surface free energy in aspects of practical wetting phenomena taking place in various systems, among others, in flotation. He found a relationship between changes of zeta potential and surface free energy of given solid surface. The obtained results allowed him to present habilitation thesis *“Studying the properties of films of organic liquids on the surface of minerals by electrokinetic potential measurements”*. The relationship between electrokinetic potential (zeta potential) and solid surface free energy was a novel approach unknown earlier in the literature and it was remarked in Prof. Robert J. Hunter monograph *“Zeta Potential in Colloid Science”* (Acad. Press 1981). In 1981 Dr. Chibowski received the habilitated doctor degree in chemistry (D.Sc.) and in 1987-1989 he was vice-director of the Institute of Chemistry at Mat.-Phys.-Chem. Faculty in UMCS. In 1989 Emil Chibowski ob-

tained scientific degree ‘professor of chemistry’. Then in 1993 he was nominated as a head of the Department of Physical Chemistry, which was later renamed as the Chair of Physical Chemistry and constituted of four Departments and he hold this position until 2012.

Professor Emil Chibowski until now continues his researches in the Department of Interfacial Phenomena. Generally, he focuses his investigations on the interfacial phenomena occurring at solid/liquid, liquid/gas and liquid/liquid interfaces, involving electrochemical phenomena, intermolecular and interfacial interaction, floatability of minerals, wettability and adhesion, contact angles and contact angle hysteresis, surface free surface energy and its components of solids, stability of dispersed systems, emulsion stability, influence of the external radio-frequency and magnetic electric fields on the properties of dispersed systems, effects of solid surface plasma treatment, and superhydrophobic surfaces. Lately one of main interest of Professor Emil Chibowski are investigations of lipid, phospholipids and sterols Langmuir films and Langmuir-Blodgett films deposited on a solid substrate, mostly in aspect of their surface free energy and the surfaces topography. Such films mimic natural biological membranes and are widely investigated in many laboratories. Professor Emil Chibowski is author of 233 research papers published mostly in international top journals, including five chapters in books, of which over 60 are joined papers with foreign co-authors. He also presented his research results at numerous international symposia and conferences in Poland and abroad. He was a recipient and leader of five government research grants in chemistry, and three project financed by European Union. His papers were cited 2918 times without self-citation, average citations per item is 18.1 and the Hirsch index  $h = 34$  (on April 22, 2016). According to Research Gate his papers were read 10284 times and cited 3410 times (on April 25, 2016).

His most meaningful achievements can be listed following:

- development and improving of flotation method for hydrophobic minerals like sulfur or coal.
- find relationship between zeta potential and surface free energy of a solid.
- confirm that radiofrequency electric field and magnetic field affect dispersed systems and electrolyte solutions.
- development of “thin layer wicking” method for powdered solids surface free energy determination.
- elaboration some simple method for superhydrophobic surface production.
- for the first time in the literature determination of surface free energy of Langmuir-Blodgett mono- and bi- layers deposited on different solid supports which shed light on the processes occurring at natural biological membranes.

Professor Chibowski was a member and vice-chairman of the Scientific Council of the Institute of Agrophysics, Polish Academy of Sciences in Lublin, member of the Editorial Board of *International Agrophysics*; member of the Editorial Advisory Board of the *Journal of Adhesion Science and Technology*, member of the Polish Chemistry

Society, and of Electrokinetic Phenomena, ELKIN International Advisory Board, and sits on several scientific committees of his Department's Faculty Council.

Professor Chibowski visited and worked at several research institutions abroad: Department of Chemistry, Baylor University, Waco, Texas (U.S.A.); Departamento de Fisica Aplicada, Facultad de Ciencias, Universidad de Granada, Granada (Spain), Departamento de Fisica, Facultad de Ciencias, Universidad de Jaén, Jaén (Spain).

Professor Chibowski's academic teaching at UMCS has comprised lectures, seminars and laboratory classes in physical chemistry for graduate, postgraduate and PhD students of chemistry, biology and pharmacy. Over 100 students obtained Bachelor or M.Sc. degrees in chemistry under his supervision. He guided five doctoral students, all of whom completed their theses. Two of them obtained DSc degree and one of whom was granted professor of chemistry degree. During his one-year sabbatical at the University of Granada, Professor Chibowski supervised the research work of two Spanish doctoral candidates. A doctoral student of Professor Robert Rowell of the University of Massachusetts, Mr. Lee Yezek, made two 3-month research visits to UMCS and worked under Professor Chibowski's guidance.

As a result of scientific cooperation between Professor Chibowski and Professors Kenneth Busch and Marianne Anderson Busch, twelve students of the UMCS Faculty of Chemistry made 10-week academic visits to the Baylor University in Waco (Texas, U.S.A.) to get acquainted with the structure and university infrastructure in America, and to do some studies. Cooperation with Professor Fernando Gonzales-Caballero of Granada University and his group resulted in about 30 joined publications, and also in several visits to Granada by young Lublin scientists, two of whom, an Erasmus programme students, one of them completed M.Sc. and other PhD at the Facultad de Ciencias of the Granada University. In recognition for his fruitful cooperation with the Faculty of Chemistry, Fernando Gonzales-Caballero received honorary professorship of UMCS at the recommendation of Professor Chibowski. Professor Chibowski also presented Doctor Kash L. Mittal from U.S.A., editor of the *Journal of Adhesion Science and Technology*, for the honorary doctoral degree of UMCS.

For his achievements as a scientist and as an academic teacher, Professor Chibowski has been honoured with many awards of the UMCS Rector, with the prize of the Minister of National Education and Sports, with the Golden Cross of Merits and the Medal of National Education and was also honoured with Knight's Cross of the Order of Polonia Restituta. He was also honored as the corresponding member of the Academy of Sciences of Granada, Spain.

### List of publications

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