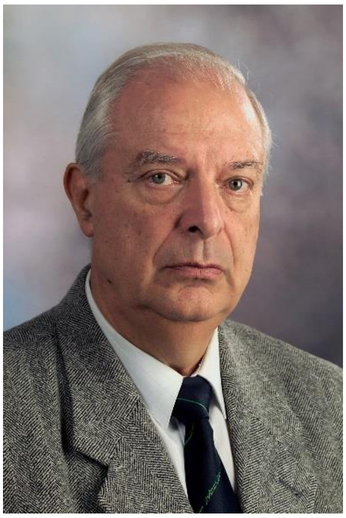
DIMO PLATIKANOV (1936 – 2017)

Dimo Platikanov passed away on 21 October 2017 in Sofia. He had enjoyed a long and distinguished career at the University of Sofia, Bulgaria.



He was a Professor of Physical Chemistry and a former Head of the Department of Physical Chemistry of the University of Sofia. This Department was established in 1925 by Professor Iwan Stranski (1897-1979) and in the years it was headed by Professor Rostislav Kaishev (1908-2002) and Professor Alexei Scheludko (1920-1995).

Dimo Nikolov Platikanov was born on 2 February 1936 in Sofia. His mother was Lyuba Zaharieva Trifonova (1908-1989), a philologist – Germanist, and his father was Nikola Dimov Platikanov (1898-1984) who was a well-known specialist in cattle-breeding and Professor in the University of Sofia and Fellow of the Bulgarian Academy of Sciences. Dimo's sister, Vesselina Platikanova, is also a physical chemist and Professor Boyan Mutaftchiev (France) – well-known specialist in crystal growth, is his cousin.

Dimo Platikanov graduated from the University of Sofia in 1958. Regarded by his professors as an unusually gifted student, Dimo was immediately employed as a Lecturer in the Department of Physical Chemistry of the University of Sofia. In that Department Dimo elaborated his PhD thesis, later he presented his DSc thesis; there he became first an Associate Professor, and later – Professor. In all these years he worked for Professor Scheludko in his new for Bulgaria colloid science research area and teaches Physical Chemistry for the students in Chemistry.

Dimo was a brilliant experimenter. But he contributed in a purely theory as well: "Disjoining Pressure of Curved Films", 1985 (with B.V. Toshev) [1], "Line Tension in Three-Phase Equilibrium Systems", 1988 (with B. V. Toshev and A. Scheludko) [2], "Disjoining

Pressure, Contact Angle and Line Tension in Free Thin Liquid Films", 1992 (with B.V. Toshev) [3], "Wetting: Gibbs' Superficial Tension Revisited", 2006 (with B.V. Toshev) [4].

The books on the modern development of Colloid science as an extension to the Nano science, appeared with the editorship of Dimo Platikanov and Dotchi Exerowa - his wife who passed away weeks before him, are much appreciated by the international Colloid science community: "Highlights in Colloid Science" (Wiley, 2008) [5] and the most recent book "Foam Films and Foams: Fundamentals and Applications" (CRC Press).

Two basic thermodynamic quantities that characterize the three-phase contact with a thin liquid film are both contact angle and line tension. The line tension, firstly introduced by Gibbs, is similar to the surface tension but in contrast it could be either positive or negative. It is extremely important to provide relieble methodologies for its experimental measuring. The contact (wetting) angles measuring and the desription of the wetting phenomena have a prolonged history. In these systems usually thin liquid films exist. The disjoinig pressure with van der Waals, electrostatic, steric and other components is the basic thermodynamic quantity which characterizes the behavior of such systems. Symmetrical and as well as asymmetrical thin liquid films exist. There are black films of two types: thicker common films and thinner Newton films. All these systems have been examined carefully by Professor Platikanov and his co-workers and more than 20 unique experimental techniques have been elaborated. It was not a surprise because Dr. Platikanov had the talent to practice science with accuracy and responsibility and it marked his long scientific activity.

Anyone knows the Scheludko & Exerowa micro-interferometric method for studying the thin liquid films. Platikanov used this method with several improvements to determine the shape of the three-phase contact in the presence of films under dynamic and as well as equilibrium conditions. The initial stages of forming plane-parallel liquid films were studied and the so called "dimpling" was recognized. This paper, broadly cited by other researchers, was published in 1964 in the Journal of Physical Chemistry [6]. Later, the equilibrium profile of the transition zone between a thin wetting film and its adjacent meniscus had been experimentally obtained (with Zorin and Kolarov) [7, 8]; in this study the evidence of the theoretically predicted by Martynov, Ivanov and Toshev "contact thickness" (instead of "contact angle") [9] had been approved.

In the research group of Platikanov three methods for experimental determination of the line tension of the contact line perimetet between a Newton black film and a bulk solution were developed: the method of the diminishing bubble, the method of the critical bubble and the method of the porouse plate (with Nedyalkov and others). These methods were based on the dependence of the contact angle on the radius of the circular conract line perimeter. The contact angle increases when the radius decreases if the line tension is positive; the contact angle decreases when the radius decreases when the radius decreases if the line tension is negative. Platikanov's data cofirm experimentally the existence of positive and negative values of the line tension. The change of the sign of the line tension can be realized by the changing the content of the bulk solution or by the change of temperature [10,11].

The thinnest Newton black films are rather solid bodies than liquid objects. Then deffects (holes) in the black film could appear spontaneously. One may expect an increase of gas permaibility through such films in comparison with the gas permeability through ticker films. Dimo's group succeded in prooving this fact (12-14]. The gas permeability coefficients of Newton black films depend strongly on the surfactant concentration. It was an important result. Thus the theory by Kashchiev and Exerowa [15] for fluctuational formation of nanoscopic holes within films and biomembranes was grounded experimentally.

Professor Dimo Platicanov was a socially responsible pearson. He always was ready to support and help his coleagues. Until the last time he was a President of the International Foundation „St. Cyril and St. Methodius" – many young boys and girls were happy to develop their professional indenties by the support of that Fondation. Professor Platikanov some time ago was a President of the Humboldt-Union in Bulgaria. Let us also mention Dimo's successful President-ship of the International Association of Colloids and Interface Sciences (IACIS).

Professor Platikanov possessed a strong historical sensitivity. It is not typical for the most of the Bulgarian people. In recent years I have published numerous texts on history of the Bulgarian society in the past – many historical testimonies – forgotten, distorted or forbidden in the second part of 20th century, were revived [16]. Dimo read these texts with a great interest and critically. Every day in our offices at the Department of Physical Chemistry we the two meet each other to talk and discuss these literary documents. Thus our friendship was developed and strengthened.

A great man and a distinguished scholar – he is Dimo. With his scientific achievements and personal features Professor Platikanov will be always remembered and honored.

REFERENCES

1. Toshev BV., Platikanov D. Disjoining pressure of curved films. Compt. r. Acad. bulgare Sci 1985; 38: 703-705.
2. Toshev BV, Platikanov, D, Scheludko A. Line tension in three-phase equilibrium systems Langmuir 1988; 4: 489-499.

3. Toshev BV, Platikanov, D. Disjoining pressure, contact angle and line tension in free thin liquid films Adv. Colloid Interface Sci 1992; 40: 157-189.
4. Toshev BV, Platikanov D. Wetting: Gibbs' superficial tension revisited. Colloids & Surfaces A 2006; 291: 177-180.
5. Platikanov D, Exerowa D (Eds). Highlights in colloid science. Weinheim: Wiley; 2008.
6. Platikanov D. Experimental investigation on the "dimpling" pf thin liquid films. J. Phys Chem; 1964; 68: 3619-3624.
7. Zorin Z, Platikanov D, Kolarov T. The transition region between aqueous wetting films on quartz and the adjacent meniscus. Colloids & Surfaces 1987; 22: 133-145.
8. Kolarov T, Zorin Z, Platikanov D. Profile of the transition region between aqueous wetting films on quartz and the adjacent meniscus. Colloids & Surfaces 1990; 51: 37-47.
9. Martynov GA, Ivanov IB, Toshev BV. On the mechanical equilibrium of the free liquid film with the meniscus. Kolloidn. Zh. 1976; 38: 474-479.
10. Platikanov D, Nedyalkov M, Scheludko A. Line tension of Newton black films. I. Determination by the critical bubble method. J. Colloid Interface Sci 1980; 75: 612-619.
11. Platikanov D, Nedyalkov N, Nasteva V. Line tension of Newton black films. II. Determination by the diminishing bubble method. J. Colloid Interface Sci 1980; 75: 620-628.
12. Nedyalkov M, Krustev R, Stankova A, Platikanov D. On the mechanism of permeation of gas though Newton black films at different temperatures. Langmuir 1992; 8: 3142-3144.
13. Krustev R, Platikanov D, Nedyalkov M. Permeability of common black foam films to gas I. Colloids & Surfaces A 1993; 79: 129-136.
14. Krustev R, Platikanov D, Stankova A, Nedyalkov M. Permeation of gas through Newton black films at different chain length of the surfactant. J Disp Sci Tech 1997; 18: 789-800.
15. Exerowa D, Kaschiev D. Hole-mediated stability and permeability of bilayers. Contemp Phys 1986; 27: 429-461.
16. https://bvtoshev.wordpress.com/

B. V. TOSHEV, Sofia, Bulgaria