

Andrejs Lūsis

Regional seminar on solid state ionics, Jūrmala, Latvia, September 2001

Published online: 8 October 2002
© Springer-Verlag 2002

The seminar brought together researchers, engineers and users from the Baltic region who are working on fast ion conductors, intercalation electrodes, solid electrochemical cells and devices (electrochromic coatings, batteries, super-capacitors, chemical and electrochemical sensors, fuel cells). With this seminar we renew the tradition from Soviet times, when the Semiconductor Material Department of the Institute of Solid State Physics at the University of Latvia organized such All Union (USSR) annual seminars on Solid State Ionics in Riga from 1981 to 1990.

Riga has some historical roots for solid state ionics (SSI). The beginning of physical chemistry (1881–1887) in Riga is connected with W. Ostwald. Several investigations related to SSI (hydrogen in palladium, color versus x of tungsten bronzes M_xWO_3) had been conducted at the University of Latvia by the physicist F. Gulbis and the chemist J. Straumanis before World War II.

Investigations in the beginning of the 1970s on ion transfer and redox processes in semiconducting copper phosphate glasses can be taken as the starting point of SSI at the University of Latvia. The conductivity switching effect in these glasses has been explained by the reversible electrochemical reduction of copper ions and the formation of a metallic filament. The application of thin films of copper phosphate glasses for recording information as an optical image was a starting point for research on functional coatings. Electrocoloration was observed in thin films of copper-tungsten phosphate glasses doped with iron. In 1972 we started to study

electrocoloration or electrochromic phenomena in tungsten oxide thin films. In 1975, there started RTD projects on electrochromic coatings for displays, light intensity control and electrophotography. The electrochromic phenomena have been understood as an electrochemical process but the functioning of electrochromic coatings has been understood as a battery. After 1977, these investigations have been performed in cooperation with electrochemists at the Department of Chemistry of our University (G. Slaidins) and with scientists from Chernogolovka (the E. Ukshe group on fast ion transport phenomena in solids). Ukshe made essential contributions to establish a SSI school in the Soviet Union. In 1981 we organized the first Annual All Union Seminar on SSI in Riga and up to 1990 10 seminars (one of them in Vilnius) were organized. The participants of the seminars came from research groups in Moscow, Chernogolovka, Leningrad (now St. Petersburg), Saratov, Sverdlovsk (now Ekaterinburg), Kiev, Minsk, Vilnius, etc.

For the “Regional Seminar on Solid State Ionics” in Jūrmala, Latvia, September 2001, 32 contributions have been presented by scientists from Moscow-Chernogolovka, St. Petersburg, Saratov, Minsk, Vilnius, Tartu, Greifswald, Uppsala and Warsaw. Some of them are published in this issue, but others will be published in following issues of this journal. These papers reflect the state of art in SSI in the Baltic region.

The seminar was kindly supported by EC FP5 project CAMART (contract no. ICA1-CT-2000-7007).

A. Lūsis
Institute of Solid State Physics,
University of Latvia, Kengaraga Street 8,
LV-1063 Riga, Latvia
E-mail: luisis@latnet.lv
Tel.: +371 7187794