

Preface

Lead/acid batteries have been in existence for over 130 years. Today, hundreds of millions of units are produced every year. This makes the lead/acid battery a mass product. There remain, however, a number of problems related to its development.

Whenever new projects are being developed (as, for example, power sources for electric vehicles or energy-storage systems), the lead/acid battery is placed 'on the reverse-players bench'. But experience has shown that this reserve player has always been brought into the game and always a more or less successful result has been achieved.

Why does the lead/acid battery have such a status? The reason is that it is not considered to be a high-tech product.

What does a 'high-tech product' mean and can the lead/acid battery become such a product? Experience has shown that high-tech products are realized by controlling, and understanding mechanistically, the technological processes at the microlevel, i.e., at volumes and sizes that range from 100 to 1000 Å. Such dimensions are characteristic of the crystal zones in the lead dioxide active mass of lead/acid batteries.

Although the lead/acid battery is more than a century old, the exact mechanism of its operation is still unknown. The development of battery science has always been guided by the immediate practical use. Funds have readily been allotted to research projects that offer immediate economic effects and make the production technology more cost-effective and reliable. In general, university researchers have regarded the lead/acid battery to be a 'black box' that is hardly a source of high-level fundamental publications. Nevertheless, in order to make the lead/acid battery a high-tech product, investments should be made in fundamental research that is aimed at studying the actual microprocesses that occur in the battery. The principal objective of LABAT meetings is to stimulate this process. This is why the papers accepted for presentation are of a more theoretical, more fundamental nature.

Many scientists from universities, research institutes and manufacturers' research and development centres took part in the 1993 LABAT Conference and gave informative scientific contributions. There was also a new element in this Conference. This was an exhibition that displayed the latest products and achievements of leading manufacturers of batteries, separators and cases, as well as equipment for the manufacture and testing of these items. Such a blend of technical and scientific knowledge will, hopefully, give an impetus to the development of the lead/acid battery.

The LABAT '93 Conference was attended by 253 experts representing 124 universities, research institutes and companies from 32 countries in Europe, North and South America, Australia, Asia and Africa. Among them, there were general directors and presidents of companies, eminent professors from universities and research institutes, as well as many world-known battery scientists and manufacturers.

Of the 60 preliminary submitted papers, 51 were presented at the Conference. These papers were organized into seven sessions under the following topics: (i) PbO₂ electrode systems; (ii) lead alloys and their anodic oxidation; (iii) valve-regulated batteries, battery charge, discharge and testing; (iv) battery technology; (v) battery models; (vi) battery optimization; (vii) separators. The Scientific Committee of

LABAT '93 selected 20 of the papers presented at the Conference for publication in the *Journal of Power Sources*.

The large attendance at the Conference was a result of extensive international participation in its planning and preparation. The thematic and scientific programme of the Conference were determined by an International Advisory Committee that consisted of scientists from 14 countries. The active participation of Dr D.A.J. Rand from CSIRO, Australia, and Dr R. Nelson from ILZRO, USA, deserves special mention. LABAT '93 would have hardly been possible if it was not supported by such prominent sponsors as: UNESCO; Johnson Controls Inc., USA; The Royal Dutch/Shell Group of Companies, UK; Amer-Sil Ltd., Luxembourg; Grace GmbH, Germany; 6 Bulgarian companies and 2 research institutes. Exhibitors at LABAT '93 included 19 companies from 10 countries.

An 11-member International Committee, comprising scientists from 7 countries, selected Dr P. Ruetschi to be the second recipient of the Gaston Planté Medal. This award is presented by the Bulgarian Academy of Sciences.

The local organization of LABAT '93 was conducted by members of the Department of Lead/Acid Batteries of CLEPS. Special thanks are due to Dr G. Papazov, Mrs M. Gerganska, Mrs S. Zanova, Mrs P. Vasileva, Mrs L. Bogdanova, Dr T. Rogachev, Dr B. Monahov, Dr B. Alajov, Dr M. Dimitrov and Dr St. Ruevski for their tireless efforts in managing the scientific and social programme of the Conference.

The Organizing Committee did its best to make all delegates feel like friends and to create an informal atmosphere during the Conference. The hotel complex of the Sunny Day Co. offered many possibilities for social contacts and discussions.

The next international conference on lead/acid batteries – LABAT '96 – will be held in the spring of 1996 again in the region of Varna in Bulgaria.

Professor D. Pavlov
Chairman of LABAT '93
Central Laboratory of Electrochemical Power Sources
Bulgarian Academy of Science
Sofia 1113
Bulgaria