

## Preface

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The world production of household batteries amounts to several billions of units per year since these common power sources are widely used for operating a large variety of popular portable devices, such as watches, cameras, radios, tape recorders, toys, etc. The most used types are the zinc-carbon and the alkaline manganese dry batteries, which alone contribute to more than 90% of the total world market. While these two cells are used for mass consumption, other types are directed to a somewhat more specialized market which may involve sophisticated devices, such as expensive cameras, cellular phones, computers, medical and military equipment, are also growing in number, especially during recent years. Among these 'specialized' batteries, one may include the nickel-cadmium, the nickel-metal hydride and the lithium batteries. In addition, to the mass sale of household batteries, several millions of lead/acid batteries are produced yearly, mainly for the automobile industry, but also for stationary power supplies and military applications.

All these batteries contain hazardous components and, consequently in recent years, concern about environmental risk associated with the uncontrolled disposal of exhausted batteries has consistently increased, especially among the member countries of the European Community. In fact, most European countries came to the conclusion that exhausted batteries cannot be directly dumped in common landfills without affecting the environment and, consequently, promoted their collection separate from other solid urban waste.

However, most of these countries still suffer from a lack of appropriate procedures for the disposal of spent batteries. Considering the environmental risk associated with an unsuitable solution of the problem, it is quite surprising that relatively little attention has been devoted to battery waste management so far. In fact in most, if not the majority, of the industrialized countries of the world, no special and systematic work has been dedicated so far to the solution or, at least, to the identification of the difficulties which still prevent the establishment of effective procedures for recycling spent batteries.

Therefore, it has appeared of importance to organize an International Conference, named 'Battery Recycling '95', where the various scientific, technical, economical and political aspects of battery disposal and recycling could be discussed and analysed by a qualified group of international experts. The site of the Conference was Lucerne, Switzerland. The choice was not casual but rather decided on the basis of the fact that Switzerland is among the most advanced countries in respect to the concern over the problem of battery disposal. In fact, today in Switzerland two household battery recycling plants are currently in operation, which is a unique record among European countries. Accordingly, part of the Conference of Lucerne was devoted to the description and to the operational analysis of these two plants, including a visit to the plants themselves in order to promote 'in situ' discussions on the various operating lines and recovery steps.

'Battery recycling '95' was attended by more than 120 scientists and twenty technical papers were presented during the three days of the Conference. Various aspects of battery waste management were illustrated and discussed. The main conclusion of this highly qualified event was that the problem of the disposal of spent battery must be faced with urgency and determination throughout the world. We are grateful to the *Journal of Power Sources* for having kindly provided this special issue for hosting the Proceedings of the Battery Recycling '95 Conference. We hope that in this way the important message which resulted from the Conference can reach the battery community and stimulate a wider interest in the problem of battery waste.

The second Conference in the series, namely 'Battery Recycling '96' will take place in France in June 1996. Hopefully, by that time the number of academic and industrial laboratories interested in this important and interesting field will be increased as will be the attendance to the 1996 Conference.

Finally, the organizers of 'Battery Recycling '95' thank the Federal Office of Environment, Forest and Landscape, Switzerland, for its effective support of this event.

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