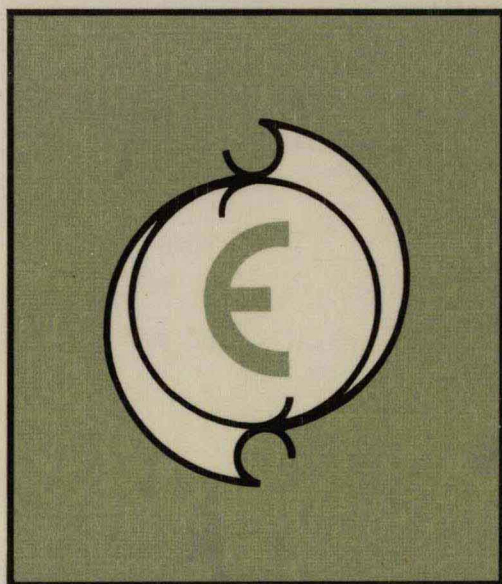


Commission of the European Communities

ANAEROBIC DIGESTION AND CARBOHYDRATE HYDROLYSIS OF WASTE



Edited by G.L. FERRERO, M.P. FERRANTI, H. NAVEAU

ELSEVIER APPLIED SCIENCE PUBLISHERS

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Edited by

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Commission of the European Communities

and

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ANAEROBIC DIGESTION AND CARBOHYDRATE HYDROLYSIS OF WASTE

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P. P. Rotondó

Commission of the European Communities

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PREFACE

This seminar was organized in the framework of the EEC R&D programme on Recycling of Urban and Industrial Waste, which started in November 1979, and will be terminated by the end of 1985.

Besides coordination activities in the different research areas of the programme, about 40 shared-cost contracts have been attributed in the field of anaerobic digestion and carbohydrate hydrolysis of waste (Area III of the programme); some of them were concluded and some were entering a final phase to complete the results obtained. At that stage it seemed appropriate to organize a seminar (open also to scientists not directly involved in the EEC programme) to provide a wider forum for an open and free discussion on the validity of the work done and to indicate the needs in research and development for future actions. The response to this seminar, to which over 200 scientists from 18 countries participated, the quality of the papers presented and the numerous special meetings on particular topics which spontaneously took place parallel to the official programme, showed the significance of the subjects treated.

The present volume includes the full texts of the survey papers, summaries of the contractor's reports and descriptions of the posters presented as well as reports on discussions.

The editors express their gratitude to all those who with their contributions and willingness to actively participate in discussions and special meetings have permitted a better understanding of the present developments on anaerobic digestion and carbohydrate hydrolysis of waste.

Brussels, May 1984.

M.P. FERRANTI

G.L. FERRERO

H. NAVEAU

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OPENING SESSION

INTRODUCTION AND GENERAL PRESENTATION
OF THE RESEARCH AND DEVELOPMENT PROGRAMME
ON RECYCLING OF URBAN AND INDUSTRIAL WASTE

Ph. BOURDEAU and G.L. FERRERO

Directorate-General for Science, Research and Development
Commission of the European Communities

SUMMARY

The research and development programme in the field of recycling of urban and industrial waste is described in broad outline, and the specific activities carried out in the fields of both Anaerobic Digestion and Hydrolysis, together with the results so far obtained, are briefly presented.

The aims of the Seminar and the expected effects on future CEC activities are briefly outlined.

For some years the European Economic Community has been engaged in various sectorial research and development programmes in priority areas, namely energy, raw materials, environment, agriculture, some aspects of medical research and industrial research, etc. These various actions have now been consolidated into a "Framework Programme" based on essential Community goals.

The research programmes take three different forms :

- direct action, i.e. research carried out directly by the Commission at its Joint Research Centre;

- indirect action, i.e. research which is contracted out with a proportion of the expenditure being borne by the Community, up to a maximum of 50 % of the total cost of the research. Contracts are signed with industry, university laboratories, regional, provincial or municipal authorities, national research centres, etc.;

- concerted or coordinated action, i.e. the Community coordinates publicly-funded research projects being carried out in the individual Member States with the research being performed under contract to the EEC.

The R&D programme on the recycling of urban and industrial waste is carried out entirely by means of contracts and coordination activities.

Over the last few years the problem of waste in general has become increasingly important, both because of its environmental impact and because of the energy and raw materials which could be saved if the products contained in the waste could be recovered.

According to recent studies, the quantities of waste arising in the European Economic Community alone have been estimated at some 2 300 Mio tonnes a year which amounts to 6.3 Mio tonnes a day. The annual total consists of :

120 Mio tonnes of household waste
950 Mio tonnes of agricultural waste
160 Mio tonnes of industrial waste
300 Mio tonnes of sewage sludge
250 Mio tonnes of waste from the extractive industries
170 Mio tonnes of demolition waste and debris
120 Mio tonnes of consumer waste (discarded vehicles, used
tyres, etc.)

These quantities increase by an average of some 3 % a year - although there are variations from country to country - in spite of the low rate of growth in industrial production and in gross national product.

It is obviously worthwhile therefore to develop technologies which can use these waste materials to the full and reduce the volume of waste arising from today's industrial processes, in particular because these recycling processes can to some extent help to solve increasingly serious environmental problems.

It is extremely important, however, that as well as developing methods of recycling we should also develop markets for the secondary materials which recycling produces so that we can make full economic use of the results of these recycling operations.

Waste can therefore be seen as a reserve - in some cases a considerable one - of unused or partially used resources which can and should be exploited more fully. If properly organized, the recycling of waste can be tantamount to conserving rare and essential resources (energy and raw materials) while at the same time yielding economic benefits.

It is estimated that at present only some 35 Mio tonnes of the Community's total municipal and commercial waste stream are recovered :