Fundamentals of Thermochemical Biomass Conversion

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ELSEVIER APPLIED SCIENCE PUBLISHERS

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ELSEVIER APPLIED SCIENCE PUBLISHERS
LONDON and NEW YORK

ELSEVIER APPLIED SCIENCE PUBLISHERS LTD
Crown House, Linton Road, Barking, Essex IG11 8UJ, England

Sole Distributor in the USA and Canada
ELSEVIER SCIENCE PUBLISHING CO., INC.
52 Vanderbilt Avenue, New York, NY 10017, USA

British Library Cataloguing in Publication Data

International Conference on Fundamentals of Thermochemical Biomass Conversion (*1982: Estes Park, Colo.*)
Fundamentals of thermochemical biomass conversion.
1. Fuelwood 2. Biomass energy
I. Title II. Overend, R. P.
III. Milne, T. A. IV. Mudge, L. K.
662'.6 TP324

ISBN 0-85334-306-3

WITH 539 ILLUSTRATIONS AND 216 TABLES

Printed in Great Britain by Galliard (Printers) Ltd, Great Yarmouth

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Preface

Throughout the world many projects have been underway to investigate the conversion of renewable biomass into energy and synthetic fuels by thermochemical methods such as combustion, pyrolysis, gasification and liquefaction. While many of these represent prior art used during the early 20th century, the recent decade since the 1970s oil shock has immeasurably increased the knowledge base for such processes. Much of the new knowledge has been gained by persons who were not trained in classical wood chemistry and there have not yet been many attempts to synthesize the knowledge into a corpus of systematic information.

To bring this about the International Energy Agency's Forestry Energy collaboration, the Gas Research Institute, the National Research Council of Canada and the US Department of Energy jointly sponsored a conference on the Fundamentals of Thermochemical Biomass Conversion in Estes Park, Colorado which was held on October 18–22, 1982.

The Conference, which was structured around invited plenary papers and contributions from researchers, served as the basis for the papers in this volume which reflect the substantial conclusions of the Conference. During the planning for the Conference, it was realized by the editors in their capacity as Co-chairmen that a major problem in biomass research was the lack of reproducibility between reported experiments and their intercomparison on account of the heterogeneity of biomass materials. A well-known wood chemist, George M. Barton, was persuaded to prepare a survey of thermochemical researchers' interests in specified standard biomass materials. The results of this were presented at Estes Park and a panel discussion on the topic held which the editors believe has made an advance in improving the data base for all biomass research.

This volume brings together, in one place, the state-of-the-art in the

many disciplines of thermochemical biomass conversion ranging from wood ultrastructure studies, wood chemistry, through to reaction kinetics. In addition, the conference's contribution to the evolution of standard reference materials research has been made the subject of the final chapter. The International Organizing Committee for the Conference consisted of:

Michael Antal, USA
Dan Asplund, Finland
Anthony Bridgwater, UK
John Cox, USA
Simon Friedrich, USA
Nils Lindman, Sweden
Oskar Zaborsky, USA

who join with the editors in hoping that this contribution to the science of Thermochemical Biomass Conversion will be of continuing use to scientists in this field.

During the final editing of this book, the editors were saddened to hear of the death of Professor Fred Shafizadeh, one of the senior contributors to this volume. His contribution to the understanding of the pyrolysis of biomass materials had been immense and he will be sorely missed by his scientific colleagues.

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