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Publications of the Oak Ridge National Laboratory Fossil Energy Program and the AR&TD Materials Program

April 1, 1995, through March 31, 1997

Compiled by

Paul T. Carlson

Fossil Energy Program Office

OAK RIDGE NATIONAL LABORATORY
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U.S. DEPARTMENT OF ENERGY
FOSSIL ENERGY

PUBLICATIONS

OF THE

OAK RIDGE NATIONAL LABORATORY
FOSSIL ENERGY PROGRAM

AND THE

AR&TD MATERIALS PROGRAM

April 1, 1995, through March 31, 1997

Compiled by
Paul T. Carlson

July 1997

Prepared for
U.S. Department of Energy
Office of Fossil Energy

by

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6285
managed by
LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
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**PUBLICATIONS OF THE OAK RIDGE NATIONAL LABORATORY
FOSSIL ENERGY PROGRAM AND THE AR&TD MATERIALS PROGRAM***

April 1, 1995, through March 31, 1997

Compiled by
Paul T. Carlson

1. INTRODUCTION

The Oak Ridge National Laboratory (ORNL) Fossil Energy Program, organized in FY 1974 as the Coal Technology Program, involves research and development activities for the Department of Energy (DOE) Assistant Secretary for Fossil Energy that cover a wide range of fossil energy technologies. The principal focus of the Laboratory's fossil energy activities relates to coal, with current emphasis on materials research and development; environmental, health, and safety research; and the bioprocessing of coal to produce liquid or gaseous fuels.

This bibliography covers the period of April 1, 1995, through March 31, 1997, and is a supplement to the earlier bibliographies in this series (see page iii). The publications listed in this document have been limited to topical reports, open literature publications, full-length papers in published proceedings of conferences, and books and book articles.

A major activity of the Fossil Energy Program is the Advanced Research and Technology Development (AR&TD) Materials Program. The objective of the AR&TD Materials Program is to conduct research and development on materials for fossil energy applications, with a focus on the longer-term needs for materials with general applicability to the various fossil fuel technologies. The Program includes research aimed at a better understanding of materials behavior in fossil energy environments and the development of new materials capable of substantial improvement in plant operations and reliability. Program work is conducted at national and government laboratories, universities, and industrial research facilities. Beginning with this report, publications of the AR&TD Materials Program, previously compiled in separate reports¹⁻⁶, and publications from non-materials activities of the Fossil Energy Program will be combined in a single report.

The environmental analysis support activities on the Fossil Energy Program address documentation required by the National Environmental Policy Act (NEPA) and other environmental support to DOE Headquarters and the DOE Federal Energy Technology Centers in Morgantown, West Virginia, and Pittsburgh, Pennsylvania.

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Introduction

Bioprocessing research at ORNL involves the conversion of coal to useful liquid and gaseous fuels as well as the removal of heteroatoms and hazardous materials from coal, coal liquids, combustion gases, and other gaseous and liquid effluents and products. Innovative microbial and biochemical pathways for bioprocessing concepts are being investigated for use in these areas, and advanced bioreactor systems that can efficiently and economically carry out such processes are being developed. Other biocatalytic systems are being investigated to remove organically bound sulfur that contaminates coal-derived liquids. Other research is focused on the production of molecular hydrogen via photosynthetic water splitting. Other cooperative research is involved with the removal of sulfur, nitrogen, and other contaminants from crude petroleum and other refinery streams.

Coal combustion research includes the analysis and control of deterministic chaos in fluidized-bed and pulverized coal combustion. Collaborations with university and industrial partners are aimed at the development of improved fossil energy process control through application of chaos theory.

ORNL provides assistance to the Strategic Petroleum Reserve Program in the development of models for planning the capacity and management of the Strategic Petroleum Reserve, and for analyzing the oil market.

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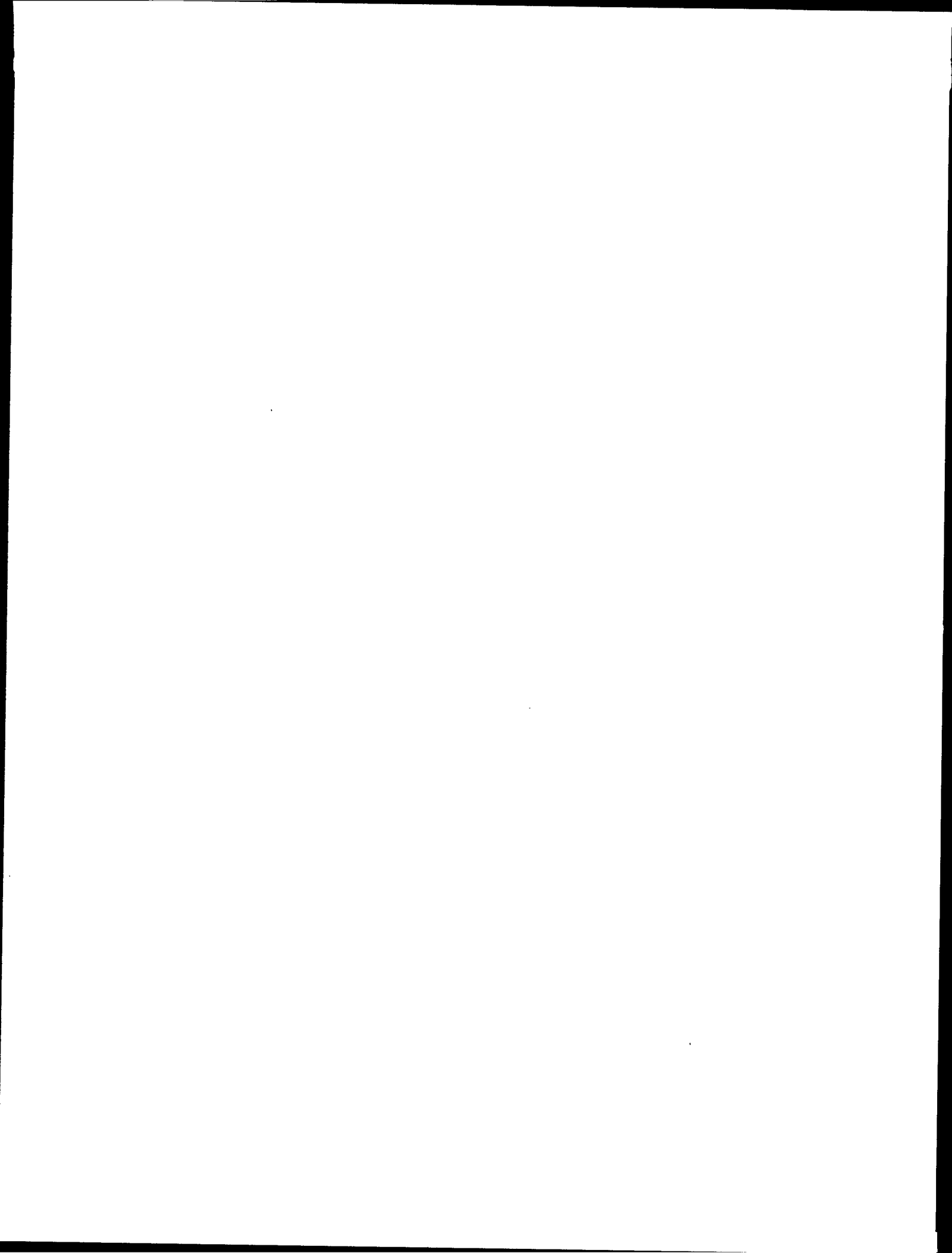
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