



Green Energy and Technology

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# Bioenergy and Biochemical Processing Technologies

Recent Advances and Future Demands

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Recent Advances and Future Demands

- Book
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## Overview

**Editors:**

- Augustine O. Ayeni,
  - Samuel Eshorame Sanni,
  - Solomon U. Oranusi
- Presents novel ideas on blue and green energy production and utilization;
  - Explores trends in microbial and enzymatic conversion processes;
  - Examines cutting edge features of drilling fluids production and oil recovery technology.

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## About this book

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This book presents novel techniques, current trends, and cutting-edge technologies in energy and biochemical processes. The authors explore recent advances that solve challenges related to the implications and commercialization of these processes by introducing new techniques or modifying existing technologies to meet future demands for food materials, bioproducts, fossil fuels, biofuels, and bioenergy. Divided into three parts, the first section of the book addresses issues related to the

utilization and management of energy towards the efficient characterization and conversion of wastes or raw-/bio- materials to useful products. The second section focuses largely on studies on molecular detection of analytes, purification, and characterization of products recovered from biochemical, enzymatic, food, and phytochemicals, as well as biostimulation and bioaugmentation processes. The final section discusses areas related to heat and mass transfer, fuel processing technologies, nanofluids, and their applications.

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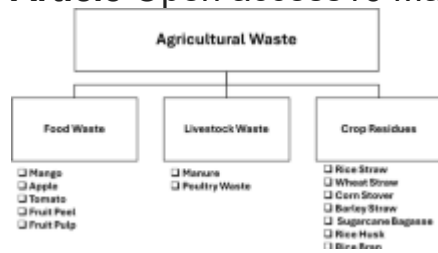
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Solomon U. Oranusi

## About the editors

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**Dr. Augustine O. Ayeni** is an Associate Professor of chemical engineering at Covenant University, where he was the head of the Department of Chemical Engineering from 2018-2021. He has more than 16 years of university teaching and research experience in Nigeria, India, and South Africa. His research specialization and interests include biochemical engineering, environmental engineering, corrosion control, chemical kinetics and reaction engineering, bioresource engineering, energy/bioenergy engineering, and process optimization techniques. Dr. Ayeni is a Registered Engineer (R.Eng) with the Council of Regulation of Engineering in Nigeria and a member of the Nigerian Society of Engineers and the South African Institute of Chemical Engineers. He has contributed substantially to the advancement of chemical engineering and applied sciences through peer-review of over 90 publications including books, book chapters, journal articles, conference papers, and the supervision of undergraduate and postgraduate student research projects. He is the co-editor of the book *Valorization of Biomass to Value-Added Commodities: Current Trends, Challenges, and Future Prospects* (Springer, 2020). He is a frequent reviewer for many high-impact scientific journals and the National Research Foundation (NRF) of South Africa.

**Dr. Samuel Eshorame Sanni** is a Senior Lecturer in the Department of Chemical Engineering of Covenant University, where he is also an academic staff member and researcher. His areas of interest include chemical reaction engineering and kinetics, process engineering and intensification, multiphase transport, energy and fuels, corrosion technology, catalysis, nanotechnology, and waste valorization. Dr. Sanni has B. Tech, M.Sc, and Ph.D. degrees in chemical engineering from Ladoké Akintola University of Technology (LAUTECH), Ahmadu Bello University, and Covenant University, respectively. He is the author of 134 journal and conference papers, has authored and co-authored several chapters in books published by Springer, Wiley Scrivener, Taylor & Francis, and Elsevier, and is the author of the book *Modelling and Simulation of Sand Entrainment and Deposits in Horizontal Oil Transport* (Scholars Press, 2016). He is a reviewer for several international journals and served as Lead Guest Editor of the special issue journal *Innovative Carbon Capture Technologies for Sustainable Engineering and Environment* (Hindawi, 2021). He is a Fellow of the Institute of Policy Management Development (FIPMD) and an active member of the International Association of Advanced Materials (IAAM), the Council for the Regulation of Engineering in Nigeria (COREN), the Nigerian Society of Engineers (MNSE), and the Nigerian Society of Chemical Engineers (MNSChe).

**Prof. Solomon Oranusi** is a Professor of Microbiology at Covenant University, where he was head of the Department of Biological Sciences from 2019-2022 and has also served as Sub-Dean of the School of Postgraduate Studies. Prof. Solomon holds a B.Sc degree in microbiology from the University of Nigeria Nsukka (UNN) and an M.Sc and Ph.D. in microbiology from Ahmadu Bello University (ABU) Zaria. He is a Fellow of the Institute of Medical Laboratory Science Council of Nigeria and a Public Analyst with MIPAN. His research interests include biogas and digestate bio-fertilizer production from food and agricultural wastes (waste-to-wealth), food safety, HACCP, and public and environmental health. Prof. Oranusi is a member of several academic and professional organizations including the Institute of Public Analysts of Nigeria (IPAN), the Association of Industrial Microbiologists of Nigeria (AIMN), the Nigerian Institute of Food Science and Technology (NIFST), the Institute of Medical Laboratory Sciences of Nigeria (IMLSN), and the American Society for Microbiology (ASM). He has published more than 130 peer-reviewed scientific articles and is a reviewer for several international journals. He has served as an examiner for postgraduate theses and dissertations and as an assessor for the promotion of applicants to the professorial cadre of academic institutions.

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