

CHAPTER-5 SUSTAINABLE CONVERSION OF BIOMASS TO ENERGY

Narayan Gouda¹, Achyut Kumar Panda², J. Manisha¹, I. Siva Ramakoti¹

narayangouda@cutm.ac.in

¹ Department of Chemistry, School of Applied Sciences, **Centurion University of Technology and Management, Odisha, India**

² Department of Chemistry, Veer Surendra Sai University of Technology, Burla, Sambalpur, Odisha, India

Abstract

National energy security, sustainability and fluctuations in the climate are the main reasons to discover an alternative, renewable and reliable resources to satisfy the energy demand. In this respect, biomass is a fascinating candidate as a substitute for fossil based fuels. Biomass as a source of fuel has been used by the humanity since long time when they learned to make fire and used as the primary source of energy earlier to the explore of fossil fuels in the twentieth century. The main advantage of the valorisation of biomass is that pushes growth in the local areas and increases value to our agricultural systems. India has occupied with ample of unexplored biomass, which might be altered into suitable energy sources. Different technologies like densification of biomass, thermal and catalytic pyrolysis, gasification, anaerobic digestion, fermentation have been used to enhance the calorific value and other fuel properties as well. This book chapter provides a brief overview of the availability of sources of biomass and different biomass conversion technologies.

5.1 Introduction

Increased industrialization, agricultural revolution, commercialization, transportation and population explosion have driven the global energy demand tremendously and placed enormous pressure on its resources. Since fossil fuels are the principal sources for energy of the world, this growth increases key issues at different social, environmental, ecological and economic levels. The amount of petroleum is diminishing at a much faster rate than its regeneration through the