

Bio-oil production using sawdust of *Triplochiton scleroxylon* in microwave pyrolysis

BADZA Kodami
Department of Applied Chemistry
ENSAI
Ngaoundere, Cameroun
badzakodami@gmail.com

KOM REGONNE Raïssa
Department of Applied Chemistry
ENSAI
Ngaoundere, Cameroon
rkregonne@yahoo.fr

NGASSOUM Martin Benoit
Department of Applied Chemistry
ENSAI
Ngaoundere, Cameroon
ngassoum@yahoo.fr

Abstract

Biomass conversion into bio-oil by pyrolytic technology is one of the most promising alternative to convert the biomass into useful products and energy. The development of bio-oil from biomass has attracted a great deal of interest not only because of the environment pollution but also because of the rapid depletion of the fossil fuel reserves. In the present work a microwave pyrolysis of *Triplochiton scleroxylon* sawdust commonly name *Ayous* is used for bio-oil and biochar production. Several power varying from 500-650 Kw, reaction time in the range 15-25 min and the amount of Wave absorber values from 10 to 30% were considered. The response surface methodology (RSM) combined with Central Composite design (CCD) is used for modeling and optimizing both the process bio-oil and biochar yield. The results show that the optimum conditions are obtained for a reaction power 576.27 Kw, a reaction time of 28.07 min and an absorption intake 3.19%. Under these conditions, the predicted bio-oil yield is around 44.8% with good pH (6.06 ± 0.4) but a very high-water content $25 \pm 1.2\%$. Whereas the biochar 39.44% is obtained under the conditions: Power 448.8 kw, an time of 12 min and an absorption intake of 17.11%. The identification of compounds by GC/MS has identified the con families of alkanes, esters, alcohols and phenolic compounds at low and high molecular weights. A global view of these results makes it possible to say that *Ayous* bio-oil can be used as biofuel, however processing operations must be carried out in order to reduce the water content and its acidity. The biochar can be directly used as a soil amendment.

Keywords : *Triplochiton scleroxylon* sawdust, Bio-oil, Biochar, Microwave-Pyrolysis