



## Products evaluation from pyrolysis process of acacia wood in Vietnam

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### ABSTRACT

Being a developing country, Vietnam has very good biomass energy potential which can be used as a substitute for fossil fuels. The present research aimed measuring yield and compositions of the products of acacia wood pyrolysis process in a packed bed reactor. The maximal liquid yield has been obtained at 450°C (49.95 wt%). Temperature has great influence on product distribution by increasing gas yield and decreasing bio-oil and char yields. The gas fraction is mainly composed of carbon dioxide and monoxide, so its heating value is rather low, but it can be burnt to supply energy to the process. CO, CO<sub>2</sub> concentration in the gas decreases with temperature. The 17 compounds in the liquid product from acacia wood pyrolysis process were determined and they included functional groups of alcohol, organic acid, aldehyde, furan, aromatic hydrocarbon and phenol. It was observed pyrolysis process generate liquid product contained different compounds due to acacia wood compound complexed. Char is solid product of pyrolysis process that has structure multi-ring aromatic hydrocarbons and appeared -CH<sub>3</sub> and -CH<sub>2</sub>- groups link with aromatic ring. Char has ability adsorption water so much due to porous structure. The porous structure was obtained due to thermal breaking of structure in pyrolysis process.

### Introduction

Vietnam is one of the few countries having a low level of energy consumption in the developing world with an estimated amount of 210 kg of oil equivalent per capital/year. Over half of the Vietnamese population does not have access to electricity. Vietnam is facing the difficult challenge of maintaining this growth in a sustainable manner, with no or minimal adverse impacts on society and the environment. Being an agricultural country, Vietnam has very good biomass energy potential. Biomass fuels sources that can also

be developed include forest wood, rubber wood, logging residues, saw mill residues, sugar cane residues, bagasse, coffee husk and coconut residues. Currently biomass is generally treated as a non-commercial energy source, and collected and used locally. The potential of biomass fuels from wood and agri-forestry residues of Vietnam was estimated up to 80-100 million tons/year. Wood waste at wood processors (sawmills and furniture makers) include wood chips, butt ends, bark and sawdust. The amount of wood waste is calculated on the basis of domestic wood production and sawn wood that includes also