

**MODELING OF BIOMASS GASIFICATION WITH CO<sub>2</sub>  
ENRICH AIR AS GASIFYING AGENT**

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## **Abstract**

The biomass gasification has been carried out using an updraft gasifier. This work focuses on the production of producer gas from biomass (Rubber Wood). Mathematical model for thermo-chemical process of biomass gasification is developed in this research work. ASPEN PLUS simulator and pilot plant gasifier were used to investigate the effect of reactor temperature, equivalence ratio and CO<sub>2</sub> to air ratio on composition of producer gas. The gasifier was operated over a temperature range of 500-1000 °C, while varying equivalence ratio from 0.2 to 0.36 and CO<sub>2</sub> to air percentage from 1% to 10% and it was found that the most of trends were similar for both the case. The results showed Carbon monoxide concentration in the product gas increases with increase in temperature and CO<sub>2</sub> to biomass ratio but decreases with increasing equivalence ratio.

**Keywords:** Updraftgasifier, biomass, equivalence ratio, Carbon dioxide to air ratio, ASPEN PLUS.

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## **Acronyams**

HHV: Higher heating value

HHV<sub>f</sub>: Higher Heating value of fuel

LHV: Lower heating value

FCR: Fuel Consumption rate

VM: Volatile Matters

FC: Fixed Carbon

ER: Equivalence ratio

SGR: Specific Gasification rate

A/G: Air to gas ratio

G/F: Gas to fuel ratio

GHG: Green House Gases