

# **Investigation of scale-up and sustainable aspects of biomass gasification for syngas production**

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## **Abstract**

Accompanied by the growing energy demand and the use of the fossil fuels, in favour to decrease the emitted carbon dioxide biomass can be a perspective opportunity to reduce the environmental effects of wastes. Value added hydrocarbons fuels, synthesis gas can also be obtained from biomass, while syngas should be suitable raw material for clean hydrogen, methanol or Fischer-Tropsch hydrocarbons.

High temperature gasification is one the most effective processes in order to produce syngas. Regarding the temperature, it is important to choose the optimal one, where the ratio of the gas components are suitable for subsequent uses. Moreover, optimal parameters can help in the scale-up procedure.

In this work, the thermal decomposition of different types of biomass waste had been investigated with TGA-FTIR method, then results were compared with results obtained from a lab scale tubular reactor. Henceforward, the product yield, the composition of gaseous product, and its time dependence was followed.

**Keywords:** gasification, biomass, syngas, TGA-FTIR, scale-up