

Project Lignin

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Objektive

At the Karlsruhe Institute of Technology at the Institute for Technical Chemistry (ITC), the waste product Lignin was investigated with regard to the combustion behavior under defined conditions in a fixed-bed reactor. It should be examined whether and under what conditions Lignin is suitable for a thermal utilization. The Lignin was extracted from wood by a treatment with concentrated hydrochloric acid.



Figure 1: waste product Lignin

Source: KIT

Realization

The experimental investigations for the characterisation of the combustion properties of solid fuels (summarized in the service package FuBe®) are carried out in the fixed-bed reactor KLEAA at the Karlsruhe Institute of Technology at the Institute for Technical Chemistry (ITC). FuBe® is a service package for a comprehensive fuel characterization including the identification of the combustion behavior.



Figure 2: burned Lignin

Source: KIT

Results

Lignin burns completely and nearly without residues, what is assessed positively with regard to the disposal and utilization of ashes. The combustion requires, in comparison with other fuels, such as Wood chips, a long residence time in the furnace due to the longer coke burnup phase.

To sum up, it can be noticed that Lignin is, compared to wood, generally suitable for a thermal utilization having regard to several aspects, like the poking and the corrosion potential due to a higher chlorine content in the fuel with 4.5 Ma.-% referring to the dry matter.

In order to make a statement on whether Lignin is a suitable fuel by itself and what conditions should be chosen for an optimal combustion process, further investigations must be carried out.

It is expected that the use of Lignin in an existing combustion plant won't cause any difficulties with regard to the combustion behaviour by adjusting the primary air distribution. A utilization in a fluidized bed is also possible.

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