

Continuous hydrothermal carbonization of biosolid

The investigation describes a system for effluent sludge disposal by hydro-thermal carbonization. It imitates natural carbonization but requires a few hours compared to natural process. The newly formed product is identified as “hydrochar” and can be used in diverse fields: energy generation by combustion in boilers, soil improvement, nano materials or fuel cells. This technology was investigated by scientists of the University of Natural Resources and Life Sciences, Vienna.

BACKGROUND

In Austria the amount of effluent sludge was mostly increasing within the last 20 years. Sludge includes impurities such as heavy metals and it has to be especially disposed. At present, almost 50 % of sludge waste is eliminated by cost-intensive combustion methods.

In regard of this investigation, an extruder, a device from plastics and food industry, was used to enable sludge disposal in a continuous, low priced and energy efficient process by producing carbon as inflammable “hydrochar”, resulting from hydrothermal carbonization.

TECHNOLOGY

The feed is preheated in a stirred tank and afterwards pumped into the extrusion section. At temperatures of 180-250°C and pressures of 10-25 bar the carbonization takes place continuously. The process can be adjusted by heating or cooling and the product is stored downstream the extruder barrel. From here the solid products are released without an additional energy-consuming drying step and the gases are partly recycled to preheat the input.

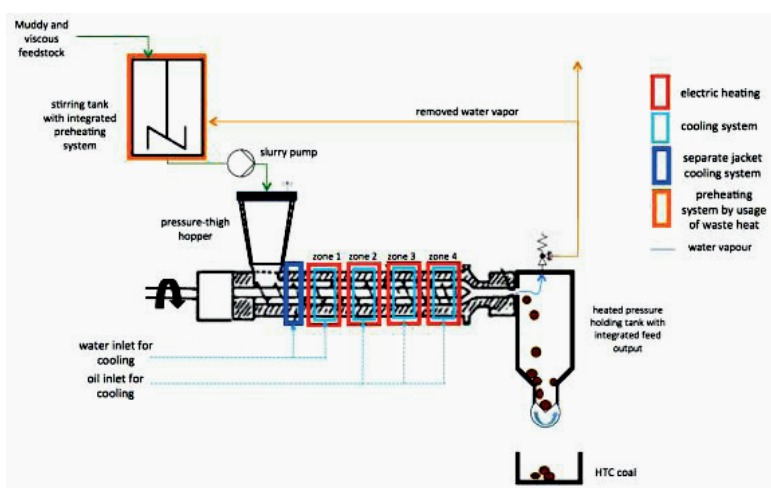


Fig 1: Suggested process scheme of continuous hydrothermal carbonization.

ADVANTAGES

- applicable for all sludge substances without a preceding drying step
- continuous operation and high throughput low cost and short time carbon production
- highly energy efficient and economical process

REFERENCE:
2015-11

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R&D cooperation
License agreement

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