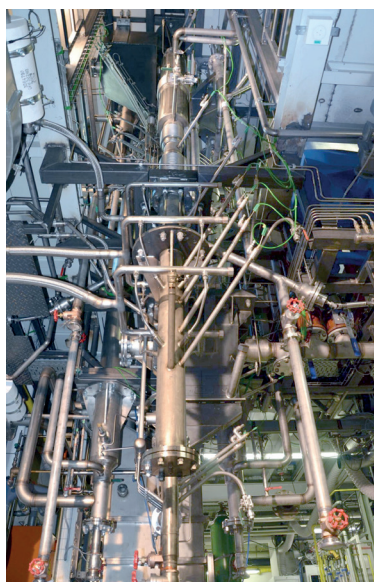


Fluidized Bed Reactor System for the Gasification of Waste Materials and Biogenic Residues

A novel dual fluidized bed reactor system for the production of a nitrogen free product/synthesis gas allows the utilization of various fuel types. The special design enables a broad fuel flexibility and the possibility to use different types of bed materials for the fluidized bed.

TECHNOLOGY

The conversion of various solid low-cost fuels into valuable gas with high energy content is attracting increasing interest within the chemical industry and the energy supply sector. For the gasification of carbonic fuels, fluidized bed processing based on the dual fluidized bed concept is utilized



Pilot plant at TU Wien

preferably. Dual fluidized bed gasification technology greatly intensifies the conversion of the solid fuels into a valuable product gas due to excellent heat transfer. The gained nitrogen-free product gas can be cleaned and utilized for heat and power production (steam or district heating), and can also be used for different chemical syntheses, to easily produce homogeneous transportable gaseous and liquid fuels. After gas cleaning steps, it is possible to produce hydrogen, hythane, Fischer-Tropsch diesel/kerosene, synthetic natural gas, and other chemicals like methyl alcohol. In addition, an enhanced gasification concept enables the in-situ capture of CO₂ without the need for energy-intensive downstream gas separation.

FURTHER INFORMATION

Experimental results from test campaigns with different generations of 100 kW pilot plants at TU Wien clearly show the huge potential of the gasifier concept for our future energy supply. The results achieved illustrate the economic advantage of the novel system. The increased fuel conversion of the novel system has the potential for an increase in efficiency from 69 % up to 75 % for industrial sized plants. An industrial pilot plant in Güssing (fuel input 8 MW) reached an operation time of more than 100,000 hours for the gasification of wood chips.

BENEFITS

- Conversion of solid fuels into a valuable product/synthesis gas
- Expandable poly-generation concept flexible to market needs
- Flexible polyfuel concept for plentiful input materials from the market
- Integration of renewable energy sources
- CO₂ separation out of the product gas with nearly no energy penalty
- Small and large scale plants possible (power and industrial sectors)

REFERENCE:
M020/2010

DEVELOPMENT STATUS:
Pilot plant in operation

KEYWORDS:
Gasification
Fluidized bed
Solid fuels
Waste
Residues
Synthesis gas

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US9089826B2
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