Fraunhofer
CBP

FRAUNHOFER CENTER FOR CHEMICAL-BIOTECHNOLOGICAL PROCESSES CBP

CHEMICAL PROCESSES
HIGH-PRESSURE UNIT

PORTFOLIO

The high-pressure unit is a flow reactor for the continuous processing of liquid reaction mixtures. This system is suitable for carrying out homogeneously and heterogeneously catalyzed reactions under pressures up to 300 bar in the aqueous phase.

Technical data

- Flow tube reactor 2.15 liters
- Dwell times approx. 5–30 minutes
- Pressure max. 300 bar
- Temperature max. 340°C
- Dosing pump max. 20 kg/h
- Phase separator

PROCESS

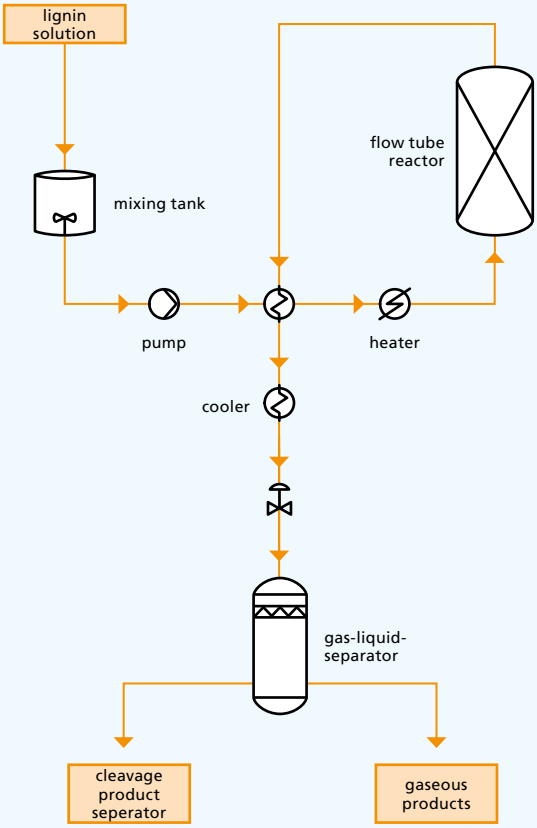
Base-catalyzed degradation of lignin

In the first step a lignin-NaOH solution is mixed in a 300-liter tank, fed into the high-pressure dosing pump and compressed to an operating pressure of max. 300 bar. At the same time a mass flow of between 5 and 20 kg/h is selected in order to regulate the retention times in the reactor.

After that, the educt is preheated with the hot reaction product to recover heat, brought to a reaction temperature between 250°C and 350°C in the heater and fed into the reactor. The approx. 2 meter long flow tube reactor is heated by a 5-zone split tube oven.

After the reaction the cleavage product solution is cooled down to ambient temperature and the pressure is decreased. Then the gaseous reaction products are separated and collected.

FLOW CHART OF THE HIGH-PRESSURE UNIT



The Fraunhofer Center for Chemical-Biotechnological Processes CBP in Leuna, central Germany, closes the gap between the lab and industrial implementation. By making infrastructure and plants (pilot scale and miniplants) available, the center makes it possible for cooperation partners from research and industry to develop and scale up biotechnological and chemical processes for the utilization of renewable raw materials right up to industrial scale.

This field of work focuses on the process-technological development of chemical processes to produce biobased basic and fine chemicals for further processing in the chemical, pharmaceutical or food industries. In addition to new process concepts, the optimization of the resource and energy efficiency of existing processes also plays an important role here. Established processes can be adapted and optimized from the ecological and economic viewpoint. In doing this, we both consider biobased raw materials and also examine conventional processes for manufacturing petrochemical products.

CONTACT

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