

Tailored membrane technology

Optimizing XTL-processes by an ingenious membrane system

Patent status:

EP 2727979 (AT, CZ, DE, FR, GB, IT) granted

US 9090520 granted

Challenges

The production on synthetic fuels through the conversion of synthetic gas via XTL-Processes and the Fischer-Tropsch Synthesis (FTS) is becoming increasingly attractive. To achieve a high yield in the FTS reactor the composition of the gas mixtures, especially the carbon monoxide (CO) and hydrogen (H₂) concentration is of big importance. With the current processes the adjustment of the gas mixture and the recycling of reactants involves a great effort.

Technology

The presented membrane system consists of several membrane stages that are characterized by separation and recycling operations. The modular property enables the system to be very flexible, adaptable to specific requirements. The gas mixture can be adjusted up- and downstream of the FTS reactor and the various membrane materials in use offer a preferable permeation of CO₂, H₂, steam and higher hydrocarbons.

Areas of Application

The gas permeation process can be used to improve FTS plants. Furthermore the presented membrane system offers the opportunity to be used for other gas separation task, like the separation of CO₂, flue gas, biogas or higher hydrocarbons from industrial waste gas.

Development Status

The stability of the used membranes have been in proven in multiple tests, from laboratory scale (H₂-selective membrane), pilot plant (CO₂-selective membrane) and industrial scale (higher hydrocarbon selective membrane).

Hence the single membrane stages possess different levels of development, from ARL 4 to ARL 9 are present.

Exploitation Opportunity

Helmholtz-Zentrum Geesthacht offers the described technology for in-licensing and/or for the further development and exploitation. Within the scope of a cooperation, interested companies can be supported in adapting this technology to their specific requirements.

Inventor

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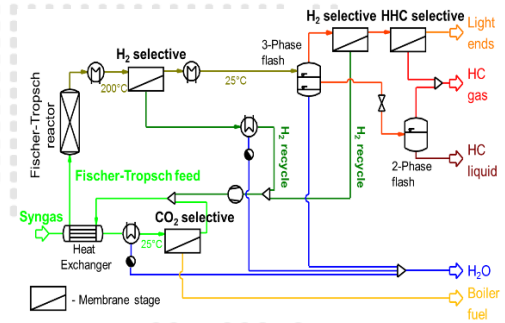


Image: HZG/PMV

Advantages:

- Flexible adaptation of the gas concentration
- No waste water treatment (s. gas scrubbing)
- Lower space requirements
- Low-maintenance

Application:

- Membranesystems
- FTS gas processing
- CO₂, H₂, H₂O separation

Industrial Sector:

- Fischer-Tropsch synthesis
- Biomass gasification
- Further XTL processes (CTL, BTL, GTL, ...)

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