Catalytic Injection Process

Catalytic Injection Process
of organic raw materials to synthetic fuel

The pressureless Chemical Catalytic Injection Process offers the unique possibility to produce storable energy with maximum energy efficiency in the form of synthetic fuel of the 3rd generation from almost all kinds of organic raw and residual materials. The technology shows a chemical engineering copy of the natural crude oil formation process and sets new standards for a resource-preserving, modern energy and recycling strategy. Sustainable mobility combined with active environmental protection!

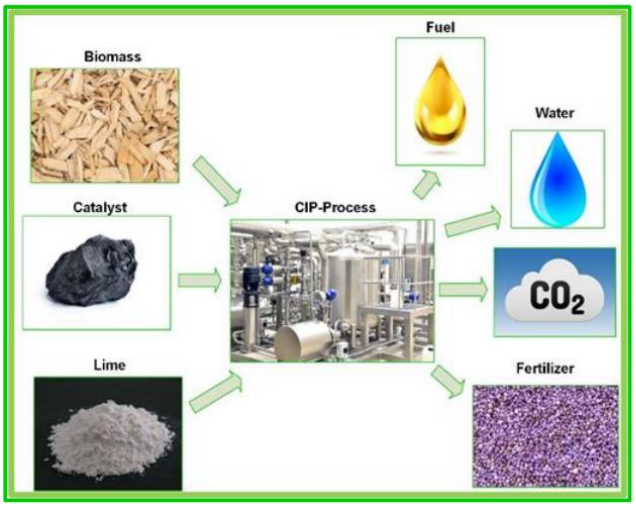
"Nothing in the world is as powerful as an idea whose time has come"

- Victor Hugo -

Catalytic Injection Process

The pressureless Chemical Catalytic Injection Process offers the unique possibility to produce a synthetic fuel from almost all kind of organic raw and residual materials, such as straw, agricultural residues, Miscanthus, bagasse, wood, paper, cardboard, plastics, brown coal, waste oil, heavy oil, etc.

The ethical principle is that no food is processed into fuel. The technology provides the opportunity to cover the world's growing energy supply in a socially responsible and sustainable manner without environmental conflicts.



Natural Catalytic Process

The previous industrial fuel production and energy technology is based on thermal processes such as pyrolysis, gasification or combustion. Nature, on the other hand, uses other conversion mechanisms based on catalytic processes: crude oil is formed from biomass over a hundred million years under the catalytic effect of a natural mineral at low temperatures, without pressure and in single-stage liquid processes, direct liquefaction. As a result of that, the atmosphere has changed from 20% CO_2 and 1% oxygen to 20.9% oxygen and 0.04% CO_2 over the past 1 billion years, making the earth a livable planet.

Therefore nature shows that a reduction in CO_2 happens through biomass! If we don't let the waste biomass decompose or burn, but catalytically process a small part into fuel, then the dependency of fossil fuel can be reduced significantly.

With every ton of waste biomass that is not converted into CO_2 by the microorganisms, but is catalytically converted into a liquid energy, 0.5 to 1 ton of fossil CO_2 can be saved. By substituting fossil fuels, each ton of catalytically produced CO_2 neutral fuel prevents the release of around 3.1 tons of additional CO_2 into the atmosphere.

Technical Realization

Under the action of natural mineral catalysts together with a partial oxidation, the biomass releases the part of water and CO_2 that is not needed for the hydrocarbon molecule. Because the hydrocarbon in its compact form, such as diesel, has a higher entropy than the biomass used, the natural process always runs automatically in this direction (biomass to liquid hydrocarbons).

In compact systems, the mixing of biomass with a catalyst in an oil at low temperatures and injection of air for a partial oxidation in a reactor without pressure results to a pure hydrocarbon, CO_2, water and atomic hydrogen (can be used to hydrogenate e.g. plastics otherwise it reacts to H_2O) according to the following formulas:

- $4\ C_6H_{10}O_5$ (Cellulose) = $8\ CO_2 + (CH_2)_{16} + 4\ H_2O$
- $4\ C_6H_{11}O_5$ (Cellulose) = $(CH_2)_{16}$ (Diesel/Kerosin) + $8\ CO_2 + 4\ H_2O + 4\ H$

The products produced are separated and distilled accordingly. The suitability of the CO_2-neutral synthetic fuel has been proven by numerous analyses.

All life is based on natural catalysts. Life is not possible without catalysts!

Flexible plant design & high economic efficiency

The compact systems are easy and flexible to use and are designed for decentralized energy production. Depending on the requirements and concept, they can therefore be operated extremely economically. Due to the high (catalytic) efficiency, a high economic efficiency with fair energy prices is possible.

Future of energy

Regarding future generations, the growing world population, dry running sources of fossil raw materials, climate change and increasing environmental pollution, this catalytic technology offers the opportunity to implement a real energy transition based on a sustainable energy and environmental strategy. The catalytic processing of residues into liquid, storable fuels presented here is the ideal complement to solar and wind energy.

A future strategy should, among other things, build on natural biomass potential and lead to a job creation program for export products as well as decentralized plant operation and the procurement of raw materials. With a catalytic conversion of just a few percent of the annual amount of biomass, enormous amounts of CO_2-neutral fuels can be produced, which in turn are the basis for numerous chemical products.

The implementation of such projects requires responsible decision-makers who recognize and understand the potential for a "CO_2-neutral energy future" based on catalyst technology in the corresponding systems.

The time is ready for catalytic processes

- ✓ Highest energy efficiency
- ✓ High quality synthetic fuels
- ✓ Active and conflict free energy production
- ✓ CO_2-neutral
- ✓ Follows ecological standards
- ✓ Self sufficient energy
- ✓ High economic
- ✓ Job creation
- ✓ Strenghten regional structures
- ✓ Decentralized energy projects
- ✓ Simple plant handling
- ✓ No unwilled by-products such as Dioxin and Furan

plastic

organic waste

waste oil & heavy oil

textiles

Brown coal