Institut "Jožef Stefan", Ljubljana, Slovenija

center za prenos tehnologij in inovacij
na Institutu "Jožef Stefan"

Licensing opportunity

New catalyst for conversion of biomass into liquid fuel with high caloric value

Field of use
Nanoengineering
Nanomaterials
Special chemicals, intermediates

Current state of technology
Stage of Development:
Available for demonstration

Patent status
secret know how

Publication
TBA

Developed by
Jožef Stefan Institute

Reference
TBA

Contact: Tomaž Lutman
Center for Technology Transfer and Innovation,
Jozef Stefan Institute,
E-mail: tehnologije@ijs.si
http://tehnologije.ijs.si/

Background

A Slovenian research institute has developed an invention which refers to a new catalyst for the conversion of lignocellulosic biomass into the liquid fuel with much lower content of oxygen thus having much higher caloric value. The researchers are looking for partners for license agreement with producers of biomass derived oils and producers of MoS2 catalysts.

Description of the Invention

Biomass, specifically wood, is one of the oldest forms of the energy sources, having been used by the humans from ancient times. The oil crisis in the mid-70s contributed to the active efforts to convert the lignocellulosic biomass to liquid fuels.

Pyrolysis is a thermochemical process that can directly convert up to 70 wt% of solid, dry biomass into pyrolysis oil, which contains cca 40 wt% of chemically-bonded oxygen and cca 20 wt% of dispersed water, resulting in low caloric value, which limits applicability of such as an energy source. Alternatively, the low temperature liquefaction in polyols with acid results in a much higher conversion of biomass into solvolytic primary oil. However, oxygen content of solvolytic oil still exceeds 40 wt% and hinders its widespread usage as a competitive fuel.

To decrease oxygen content in oils, thus making converting process of biomass more attractive for the market, additional methods must be employed, such as hydrodeoxygenation method.

Slovenian research institute is offering a solution based on innovative catalyst for conversion of biomass into liquid fuel giving higher caloric value of the fuel.

The solution

Hydrodeoxygenation (HDO) using MoS2 with modified morphology as a catalyst, which has high activity and selectivity for C-O bond rupture, thus allowing conversion of biomass into oil with much lower content of oxygen.

Main Advantages

- High surface area of catalyst.
- High concentration of surface active sites responsible for HDO.
- Catalyst with high selectivity towards HDO.
- Conversion with significantly lower content of oxygen.

»The investment is co-financed by the Republic of Slovenia and the European Union under the European Regional Development Fund.«

REPUBLIC OF SLOVENIA
MINISTRY OF EDUCATION, SCIENCE AND SPORT

KONZORCIJ ZA PRENOS TEHNOLOGIJ IZ JRO V GOSPODARSTVO

REPUBLIC OF SLOVENIA
MINISTRY OF EDUCATION, SCIENCE AND SPORT
»The investment is co-financed by the Republic of Slovenia and the European Union under the European Regional Development Fund.«
KONZORCIJ ZA PRENOS TEHNOLOGIJ IZ JRO V GOSPODARSTVO