WAGENINGEN
UNIVERSITY & RESEARCH

- OBIOMASS - SYNGAS - SYNTHESIS GAS
- FLEXIBILITY
- DYNAMIC GAS MIXTURES

A SOLID BUSINESS CASE IN COLLABORATION WITH

WAGENINGEN UNIVERSITY & RESEARCH

GENERAL INFORMATION ABOUT THE PROJECT

TARGET OF THE PROJECT:
Preparing syngas mixtures

DEPARTMENT:
Laboratory of Microbiology

HEAD OF PROJECT MANAGEMENT:
prof.dr. DZ (Diana) Machado de Sousa

ROLE OF MCQ INSTRUMENTS:
To provide a stable Gas Flow and precise Gas Mixtures

MORE INFORMATION ABOUT THE COMPANY

'To explore the potential of nature to improve the quality of life' That is the mission of Wageningen University & Research. Over 6,800 employees and 12,900 students from more than hundred countries work everywhere around the world in the domain of healthy food and living environment for governments and the business community-at-large.
https://www.wur.nl/en/About-WUR.htm

DESCRIPTION OF THE APPLICATION AND THE TARGET

The transition towards a circular economy demands of novel industrial processes that reduce carbon emissions and ensure sustainable production of chemicals and fuels. In this context, a technology that has received increased attention within recent years is syngas fermentation. Synthesis gas, or syngas, is a mixture of mainly CO, CO2 and H2 that can be obtained from the gasification of virtually any carbonaceous material, including waste resources and lignocellulosic biomass. Syngas also constitutes an important industrial off-gas, contributing significantly to greenhouse gas (GHG) emissions into the atmosphere. Acetogenic bacteria can use this CO-rich gas as substrate, producing organic compounds such as acetic acid and ethanol. In this project, we aim at expanding the array of products to longer-chain fatty acids and alcohols than can serve as platform chemicals. Teamwork is the key to achieve this: synthetic microbial consortia can be built that combine the necessary metabolic pathways to yield the desired products.
This project builds on previous work carried out at the Laboratory of Microbiology that demonstrated the production of butyric acid (C4), caproic acid (C6) and their respective alcohols from syngas by a co-culture of Clostridium species. Here, we intend to produce the odd-numbered fatty acids valerate (C5), heptanoate (C7) – and perhaps even longer-chain fatty acids- and their respective alcohols, which are rare in nature but serve as important building blocks in the chemical industry. Following a modular approach, a propionic acid-producing bacterium will be incorporated into the existing co-culture in order to promote the production of odd-chain products.

https://www.wur.nl/en/project/Syngas-to-platform-chemicals-a-matter-of-microbial-teamwork.htm

BENEFITS AND SAVINGS

Buying cylinders of natural gas blends is expensive and limits the availability of mixtures that may be required. Gas cylinders are also large and often require special storage arrangements, as well as taking up valuable space.

By using the MCQ gas blender it is possible to create gas mixture at any time, and to a certain degree, different concentrations of the blended natural gas mixture. The ability to blend natural gas simulations on-demand is an incredibly powerful tool in the development of innovative gas detection equipment. And provides a level of flexibility that gas cylinders cannot provide

GAS MIXER VS GAS CYLINDER

The ability to blend O2 simulations on-demand is an incredibly powerful tool in the development and provides a level of flexibility that gas cylinders cannot provide.

COSTS AND SPACE SAVINGS:

Our GB4000 Series allows Wageningen University & Research to have a method of generating gas mixtures containing a wide variety of gas concentrations. This is traditionally achieved using pre-mixed compressed gas cylinders, though this requires substantial infrastructure and space, with offering limited flexibility in terms of available

TIME SAVINGS: -70%

Easier setup management of the hardware. Easier setup management of the software.
Less time spent titrating adequate gas mixtures.

STABLE FLOW & REPEATABILITY:

Thanks to our revolutionary method every gas flow has a great stability as Wageningen University & Research can easily conduct repeatability tests that can be used to verify components quality.

EASY TO USE SOFTWARE:

Thanks to our Software PRO Version and its easy-to use user interface, now the Wageningen University & Research can easy set all the experiment through our software.

SUCCESSFUL ACHIEVEMENT:

GB4000 Series offers a more flexible and user-friendly option to deliver custom gas mixtures to an oxygen regulated microscope perfusion system.

READY TO TALK ABOUT YOUR SOLUTION?

info@mcqinst.com - www.mcqinst.com