

Chemical Engineering & Mass Spectrometry 2018: AHPD is an innovative biotechnology for direct biomethane production from wastewater; AHPD can be combined with AH2PD for biotic CO₂ fixation with hydrogen in one single step green gas reactor- Christiaan Emanuel Zagt- Wageningen University and Research

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Autogenerative high pressure digestion (AHPD) generates 20 bar of biotic pressure in a closed vessel by anaerobic CH₄ and CO₂ production from organic waste, waste water and WWTP sludge. According to Henry's law, CO₂ will dissolve into the water phase, resulting in 90% of CH₄ in the production gas phase: green natural gas quality. The AHPD process specifically selects hydrogenotrophic methanogenic archaea that will reduce the dissolved CO₂ by adding hydrogen: the so called AH₂ PD process (bio-Sabatier). The AHPD/ AH₂ PD processes can easily and economically be combined in a continuous green gas production plant for waste water treatment. Therefore, it can be used to stabilize the sustainable power grid, as hydrogen is produced from excess power. The existing natural gas grid will subsequently be used for largescale seasonal power storage, much more efficient than electrical batteries. AHPD/AH₂PD was intensively tested with a single stack large scale pilot plant in cooperation with several Dutch universities, waterboards and energy companies.

In surgical rooms, doctors can now operate on patients remotely from their computer screens, guiding robotic arms to an accuracy of a few nanometers. Genetic laboratories equipped with DNA splicing enzymes, a mere sequence of polypeptide chains, can make wonders happen. The entire genetic makeup of human beings can be deconstructed into understandable genetic codes. Medical biotechnology has moved forward by leaps and bounds in the last few decades.

The speed at which water flows through the article chamber decides the convergence of the arrangement. Slow flow with this arrangement provides a response which is almost 30% form corrosive by weight, while faster fluxes allow refocusing. Specialists hope to obtain higher bindings from advanced reactors that recognize the gas flow to give off unaltered form corrosive fumes.

The Rice laboratory worked with the Brookhaven National Laboratory to see the procedure underway. X-beam digestion spectroscopy, an extraordinary system open on the Inner Shell Spectroscopy bar line at the Brookch Lab's national light source Synchrotron II, permits us to test the electronic structure of electrocatalysts in operando - c "That is to state during the procedure of true substance," said co-maker Eli Stavitski, head scientist on the beamline at the ISS. "In this work, we have followed the oxidation conditions of bismuth at various prospects and have had the opportunity to distinguish the dynamic state of the pulse during the reduction of carbon dioxide."

With its current reactor, the laboratory created a form corrosive constantly for 100 hours with immaterial degradation of the parts of the reactor, including the nanometric pulses. Wang recommended that the reactor can be reorganized effortlessly to provide items of higher esteem such as acid corrosives, ethanol or propanol.

"The master plan is that the decrease in carbon dioxide is important for its impact on an increase in

temperature across the Earth, as well as for a green synthetic suit," said Wang. "In the event that the energy comes from sustainable sources like the sun or the wind, we can make a circle which transforms the carbon dioxide into something important without emanating a greater quantity of it.

Biography

Christiaan Emanuel Zagt (MSc) has completed his MSc in Biotechnology from Wageningen University and Research, the Netherlands. He is the Director of Bateau Group, a R&D and green gas production organization. He has developed several innovative technologies for waste water treatment and sustainable energy production and brought into operation.

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