

Project Information

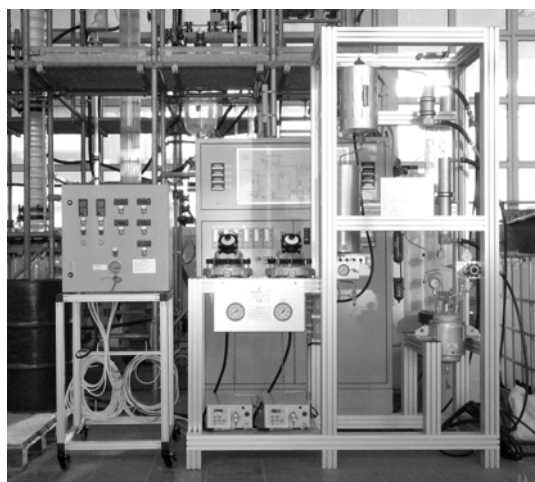
Subject: Production of hydrogen from the organic materials with supercritical water

Applicant: Institute for Energy and Environmental Technology (IUTA)
Bliersheimerstr. 60
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Project Duration: 1.4.2006 – 31.08.2008

Project Partner: E.ON Engineering GmbH
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Project description:

Fuel cell and hydrogen technology finds more and more applications in industry and everyday life. A local hydrogen supply remains however challenging. For these purposes a test program with a pilot plant is currently being carried out at IUTA. Hydrogen is produced by the reaction of organic fuels of both fossil and biogenous nature with supercritical water ($T > 374\text{ °C}$, $p > 221\text{ bar}$).

The scope of the project is to demonstrate the general suitability of the SCWR procedure (**SuperCritical Water Reforming**) for hydrogen production from different liquid organic materials. As organic materials decane ($C_{10}H_{24}$, a model compound for diesel fuel), kerosene, diesel fuel, waste oil and biofuels (biodiesel, bioethanol and biomethanol) are chosen. However, the process can be used to produce hydrogen by using practically any organic liquid material, even waste.

The utilization of aqueous wastes, which are e. g. formed during biodiesel and bioethanol production, is of particular interest here. While with other procedures, the processing of such wastes gets complicated and expensive, the high water content is even beneficial in the SCWR process.

Additionally, during the project operational experiences will be gained to improve material, technical and process engineering.

The data and experience gathered during the project (e.g. on materials, reactor geometry, heat linking, manufacturing technique, process parameter) will help to adjust design parameters for both up- and down-scaling of the pilot plant. This will prepare for a future promotion of the SCWR technology for mobile and local applications (hydrogen supply for fuel cells) and for immobile large scale applications (coupling with power plants).



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