Pulsed Compression II; Ethylene production

Publieke samenvatting / Public summary

Aanleiding

Ethylene production at present (either from ethane or naphta – i.e. hydrocarbons - by cracking) is carried out in very large scale reactors and is very energy intensive. Ethylene is an essential feedstock for chemical production. A much more energy efficient, local and small scale production of ethylene from methane is much wanted. In theory, production of ethylene in this way is much more energy efficient compared to the presently followed routes. In an earlier successful project it was experimentally proven that by a single shot in a pulsed compression reactor sufficient conversion of methane into ethylene could be realized.

Doelstelling

This project aims to prove that also by repetitive pulsed compression scale the conversion to ethylene indeed can be realized in practice at a substantial higher energy efficiency compared to presently used routes, and is an essential step for justifying small pilot experiments to proof TRL 7.

Korte omschrijving

First, in a single shot reactor experiments will be carried out aiming at optimizing the operational conditions and procedures for maximal mass balance closure, precision and accuracy on tests performed with CH4/H2 mixtures (and avoiding dilution by a noble gas). Full mass and energy balances should be determined and thermodynamic and kinetic models developed. Next, a continuous lab-scale reactor will be designed, constructed, commissioned and used for experiments to show continuous operation is possible and to identify and

Projectinformatie / Project information

Projectnummer / Project number
TEEI118005
Subsidiebedrag / Grant amount
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Algemene informatie / General information

Penvoerder / Secretariat
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understand particularities of continuous operation. principle basic design for a pilot industrial reactor and process will be made. A a test program will be proposed to be carried out on this pilot. A first attempt will be made to estimate the costs for a full scale industrial plant. An evaluation will be made to see whether sufficient evidence is collected to justify entering into a pilot phase. If so, a subsequent project proposal to start the pilot and to perform tests at TRL 7 will be submitted. This moment may be earlier than the end of this project,

Resultaat

The project will prove whether economic viable energy efficient (better than presently used routes) and/or small scale local ethylene production from (bio)methane by pulsed compression technology is possible. Readiness is reached to enter into TRL7 development.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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