

# High temperature gas-cooled reactor hydrogen production and solar container

An ASPEN simulation module of the full hydrogen production process was constructed, and the effects of the heat and electricity ratio on the hydrogen production rate and energy costs were analyzed.

Under the plan, which aims to produce hydrogen using heat generated by a gas reactor, the facility will be built next to the site of the High ...

In their proposal, they coupled the Cu-Cl thermochemical cycle and high-temperature electrolysis as hydrogen production methodology with the high-temperature gas-cooled pebble-bed ...

High temperature gas-cooled reactor (HTGR) with inherent safe characteristics has a potential to contribute to decarbonization of hard-to-abate industries by supplying a large amount of ...

1. Introduction High Temperature Reactor (HTR) technology has been developed from the late 1940s in US and Germany. The present Very High Temperature Reactor (VHTR), operating at  $\approx 7500\text{C}$ , has ...

Abstract This work proposes tritium (T) production using a high-temperature gas-cooled reactor (HTGR) and studies it for the initial T inventory in a demonstration fusion reactor and a ...

The coupling of the iodine-sulfur (IS) cycle and the very-high-temperature gas-cooled reactor (VHTR) is an advanced nuclear hydrogen production proces...

Abstract To enrich the existing research methods and content, two improved very high temperature gas-cooled reactor and iodine-sulfur (I-S) cycle-based nuclear hydrogen and steam and ...

High temperature gas cooled reactors (HTGRs) are superior to other reactor models when considering nuclear hydrogen production, due to the high outlet temperature and inherent safety of these reactors.

By examining the hydrogen production reactor, the amount of hydrogen produced in the system is  $34 \text{ mol m}^{-3}$ . Also, the irradiation distribution of the cavity receiver and the temperature ...

This study evaluates hydrogen production and storage systems operating with a high-temperature gas-cooled reactor (HTGR). The hydrogen production methods of solid oxide electrolysis ...

Coupling the High-Temperature Gas-cooled nuclear Reactor (HTGR) with the SOE (solid oxide electrolyzer) either requires a high amount of additional electricity (to power the ...

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The concept of hydrogen and electricity cogeneration can realize the cascade and efficient utilization of high-temperature heat derive for very high temperature gas-cooled reactors ...

The high-temperature gas-cooled reactor (HTGR), one of the advanced nuclear reactor technologies currently under development, can typically produce 700°C or higher reactor outlet temperature, ...

High-temperature gas-cooled reactors (HTGRs), also known as very-high-temperature reactors (VHTR) are Generation IV reactors that can operate at very high temperatures and use a graphite-moderated ...

However, current hydrogen production methods rely on fossil fuels. The majority of hydrogen in the U.S. is produced using the steam-methane reforming process, in ...

Hydrogen production and storage systems combined with HTGR are evaluated. Hydrogen production using SOEC + storage using compression is the most economical. The system ...

The Very High Temperature Reactor (VHTR), one of six Gen IV nuclear system candidates, is designed for electricity and heat cogeneration, and its high outlet ...

Significant efforts are underway in several Member States to develop high temperature gas cooled reactors (HTGR) based on either pebble bed or prismatic designs. All these reactors are primarily ...

Sakaba, Conceptual design of hydrogen production system with thermochemical water-splitting iodine sulphur process utilizing heat from the high-temperature gas-cooled reactor, Int J Hydrogen Energy, ...

Given the scope of the modeling, information is provided on the four phases of solar concentrator, solar reactor, Zn separation from oxygen with nanofluid cooling and hydrogen ...

FuSTAR system is designed to address production capacity issues in areas with energy shortages or resource concentration and can be combined with high-temperature process heat to ...

High-temperature gas-cooled reactor Refueling floor at Fort Saint Vrain HTGR, 1972 A high-temperature gas-cooled reactor (HTGR) is a type of gas-cooled ...

An improved very high temperature gas-cooled reactor (VHTR) and copper-chlorine (Cu-Cl) cycle-based nuclear hydrogen production system is proposed and investigated in this paper, ...

High temperature gas-cooled reactor (HTGR) with inherent safe characteristics has a potential to contribute to decarbonization of hard-to-abate industries by supplying a large amount of hydrogen ...

This study conducts a thermodynamic analysis for two very-high-temperature gas-cooled reactor-driven

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hydrogen and electricity cogeneration systems integrating an iodine-sulfur cycle ...

Both thermo-chemical and electrolysis (hybrid) processes in hydrogen production have a promising future, especially when integrated with Generation IV nuclear power plants. Efficient heat ...

Use of the HTGR as a major supplier of electric energy has been established. However, the total market for energy forms other than electricity is large and represents a new potential use for nuclear ...

Download Citation | On May 1, 2025, Su Won Lee and others published Economic evaluations of hydrogen production and storage systems coupled with high-temperature gas-cooled reactors | Find, ...

The molten-salt-cooled Advanced High-Temperature Reactor (AHTR) is a new reactor concept designed to provide very high-temperature (750 to 1000°C) heat to enable efficient low-cost ...

We have proposed tritium (T) production using a high-temperature gas-cooled reactor (HTGR) and explored its application for initial T possession in a demonstration (DEMO) fusion ...

At present, the high-temperature gas-cooled modular reactor (HTGR) is one of the most promising solutions for highly efficient production of electricity, heat and hydrogen due to its high ...

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