



Sofc systems Guam

What is a SOFC system?

SOFC systems offer high efficiency pathways to produce electricity from fuels. Their peculiarity consists in being flexible in fuels and high efficiency with regard to the generation of electric energy, also delivering a valid contribution to the issue of environmental sustainability when fed with biofuels.

What is a SOFC-GT control system?

SOFC-GT hybrid system . Fig. 73. SOFC-GT control system . The control strategy was designed to manage the SOFC-GT by using only one converter between the hybrid power system and the microgrid.

Can SOFCs be used as auxiliary power sources?

Based on the stack design, a 3-cell stack consisting of 12 × 8 cm 2 cells was successfully fabricated and tested for 120 h of operation. Since 1984, SOFCs have been employed in aircraft as well as auxiliary power sources for land-based transportation systems. It was only published in 2004 that SOFCs might be used as an APU system for aviation.

What is SOFC/GT/St?

For SOFC-gas and steam turbine hybrid power systems(SOFC/GT/ST),refer to the scheme of Figure 13 in section "From Cell--Stack--Balance of Plant". There have been many studies on SOFC/GT/ST [288,289,290,291,292].

Do biogas-fed SOFC power systems integrate with biogas purification and CCS?

A techno-economic evaluation of two different configurations of biogas-fed SOFC power systems integrated with biogas purification and CCS was conducted.

What is HS-SOFC?

A modular codenamed "HS-SOFC" was used to obtain the design and off-design performance of the hybrid system. The hybrid system plant is shown in Fig. 45. Fig. 45. Simplified layout of hybrid system (Personal Turbine and SOFC) . The system demonstrated potential efficiency at 56% at the design point.

??? sofc/gt ?????? sofc ?????????????????????? ????? SOFC ?????????????????????? ?????????????????????? ...

Zum effizienten Einsatz von biogenen Energietr& #228;gern zur Bereitstellung von Strom und W& #228;rme k& #246;nnen Brennstoffzellen einen wichtigen Beitrag leisten, da sie einen hohen Wirkungsgrad bei der Energiewandlung & #252;ber einen weiten Leistungsbereich von...

Faults of solid oxide fuel cell (SOFC) systems can affect the characteristics of the stack and inhibit SOFC system commercialization. It has been found that the temperature fluctuation of the burner caused by fluctuation of steam flow rate would greatly affect the temperature of SOFC system and even exceed the safe

operation range. Firstly, this paper introduces a mathematical model for ...

Download scientific diagram | SOFC system structure. from publication: Data-Driven Voltage Prognostic for Solid Oxide Fuel Cell System Based on Deep Learning | A solid oxide fuel cell (SOFC) is an ...

Abstract: This paper studies the multi-MPC control of a typical solid oxide fuel cell (SOFC) system. As a potential generation technology, the SOFC system has a series of merits, such ...

directly to the SOFC stack for additional power production or to a new stack in the so called cascade configuration [21]. The aim of this paper is to design, model and study an improved ammonia-SOFC system. The novelty of this study is related to the application of cascading and off-gases use in ammonia fuelled SOFC power systems. The use of ...

Solid oxide fuel cells (SOFCs) can in theory utilize such fuels in a high efficient manner, which could reduce greenhouse gas emissions and energy demand. However, SOFC systems able to directly utilize diesel are rather complex to design and monitor, leading to several possible causes of system lifetime reduction.

This review encompasses the components of biomass integrated gasification-SOFC technology including biomass characteristics, the thermochemical conversion in gasifiers and the factors affecting the gasification process, the cleaning technologies for raw producer gas and its conditioning and finally the integration of gasifier with SOFCs.

This dynamic duo allows you to perform accelerated and efficient analysis and troubleshooting of SOFC systems in the early concept phase. System simulation of solid oxide fuel cell applications takes into account complex phenomena such as heat and mass transport, electrochemical reactions, gas phase species conversion and the influence of material properties on stack ...

Solid oxide fuel cell (SOFC) is regarded as a next-generation energy conversion device, due to its high energy conversion efficiency (ca. 60%) and waste heat recovery rate. Using natural gas reforming catalysts to generate hydrogen-rich fuel for the SOFC stack is one of the critical technologies for small SOFC systems. It was found in our previous study that a ceria (CeO_2) ...

This paper presents a review of system design and analysis, and transient control and optimization of solid oxide fuel cell-gas turbine (SOFC-GT) hybrid systems for different ...

In actual SOFC systems, SOFC stack, combustion chamber, reformer, etc. are usually installed in a heat box. Based on this configuration, in the simulation, we assume that the thermal energy of the reforming reaction is provided by the COMB1. By adjusting the thermal energy supplied by COMB1 to Reformer, the methane conversion rate reaches 90%.

The combination of biomass gasification with fuel cells, especially high temperature Solid Oxide Fuel Cells

(SOFCs) promises sustainable and highly efficient (decentralized and modular) energy conversion systems. This review encompasses the components of biomass integrated gasification-SOFC technology including biomass characteristics, the thermochemical ...

This review provides an overview of the solid oxide fuel cell/gas turbine (SOFC/GT) hybrid system, highlighting its potential as a highly efficient and low-emission power generation technology.

class system prototype was set up at Kyushu University, and by 2017, MEGAMIE had its commercial launch in Japan. As of February 2020, the Kyushu University prototype has achieved a continuous run of 25,000 hours. a High-E~ciency Combined Power Generation System for Solid Oxide Fuel Cells (SOFC) Power the Globe with

The tri-reformer-SOFC system requires heat management to reduce energy consumption and to average temperature profiles. In this paper, four system configurations were built with two gas recirculation strategies (anode off gas recycling and burner off-gas recycling) and two reformer types (with heat exchange and oxygen injections). 1-D spatial distributions in the ...

EFCF 2024: 16th European SOFC & SOE Forum 2 - 5 July 2024, Lucerne Switzerland A0820 / Page 2-7
Introduction In the scope of the SchIBZ and MultiSchIBZ projects funded by the German Ministry of Transport and Digital Infrastructure, a modular LNG-fueled SOFC system was designed to be used in an intermodal container on board seagoing ships.

This work investigates the thermodynamic analysis of syngas production from several fuels by steam reforming or dry reforming for SOFC-integrated systems. Four commonly used fuels are considered: methanol and glycerol (alcohols), methane, and diesel (hydrocarbons). The integrated system is modeled on Aspen Plus using the Gibbs free energy minimization method and a ...

Natural gas is currently considered the state-of-the-art fuel for solid oxide fuel cell (SOFC) systems for distributed power generation of any size [1], from 5 kW domestic plants [2], [3] to 1 MW systems [4], [5]. This is mainly due to its availability, capillary distribution system, cleanness, and ease of conversion into hydrogen.

The size of the 8.4MW SOFC system is similar for the five carriers as expected. The dynamic performance of the LOHC system shows that the hydrogen flow rate can be effectively controlled by acting on the LOHC flow rate, reactor temperature, and pressure. However, LOHC systems are heavier (by a factor of 1.6 to 2.1) and larger (by 1.6 to 2.3 ...

In addition to low carbon emissions of SOFC-GT systems, the hybridization of gas turbines and SOFCs provides an opportunity to better manage SOFC airflow through bypass valves or turbine speed variation [14], and to control the heat energy passed from the SOFC to the turbine [15], thus offering better thermal management and the potential for rapid load ...



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