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Autor(en) des Beitrags: Herrmann, S.; Gaderer, M.; Spliethoff, H.
Titel des Beitrags: Integrated gasification and solid oxide fuel cell system
Abstract: A novel gasification concept combining entrained flow gasification of coal and Solid Oxide Fuel Cells (SOFC) has been developed, simulated and evaluated in Aspen Plus®. The main characteristic of the concept is a recirculation of anode exhaust from the SOFC to the gasifier in order to substitute transport gas and gasification agent. At the same time a share of the unconverted fuel and heat from the anode outlet is chemically recycled and thus the cold gas efficiency of the gasifier is found to increase from 82.1% to 83.2%. However, the impact of the recirculation approach has been found to be limited due to the fact that too high flows of additional gas lead to a decrease in efficiency because of rising heat duty. The maximum electrical efficiency achieved in the coupled system reaches up to 62.8%.
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