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Optimization of Susceptor Induction Heating for Generation of Hot Gas

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Industrial high-temperature applications have traditionally depended on fossil energy sources, which are inherently inefficient. Consequently, there is significant interest in exploring efficient and sustainable alternatives. Induction heating technologies, known for their energy efficiency, can be powered by renewable energy sources. This study presents and models a device designed for susceptor-based induction heating of gas, capable of achieving process temperatures exceeding 1800 ℃. The system works by injecting cold gas into a chamber filled with a highly electrically and thermally conductive porous material. This material is inductively heated and subsequently transfers heat to the gas flowing through it. The performance of this system has been experimentally validated using a hot-gas generator.

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