Sodium chloride solar power generation

Can SGSP capture and store solar energy in the presence of salt?
Valderrama et al. constructed a cylindrical SGSP for the capturing and storage of solar energy in the presence of salt (NaCl). The pilot plant achieved a maximum temperature of 55 °C in August and further studies were conducted on the stability of salt gradient and heat storage under different weather conditions.

What is a sodium chloride salt heat exchanger?
Based on the design parameters of the CSP reference case, the heat exchanger model presented in Section 2 is characterised as a sodium-chloride salt heat exchanger. For safety precautions and to reduce thermal losses, sodium was placed on the tube side, while the chloride salt was on the shell side.

How does a chloride salt storage system work?
Chloride salt is dispatched to a supercritical CO2 (sCO2) power cycle to provide electric power to the grid. The design integration is a conceptual match for the current sodium receiver to solar salt storage to steam-Rankine power cycle promoted by developer Vast Solar,which may facilitate commercial acceptance and development.

Does a sodium-chloride salt heat exchanger have a SCO 2 power block?
In order to fill the identified literature gaps, this study proposes a techno-economic analysis of a sodium-chloride salt heat exchanger included in a sodium-based CSP system with a sCO 2 power block. Fig. 1 shows a schematic representation of the investigated CSP layout.

Is sodium chloride salt TES a viable solution?
The obtained LCOE values lower than 70 USD/MWh highlight that advanced CSP systems employing sodium and chloride salt TES can represent an economically viable solutionand can drive towards the future goal of 5 USD/MWh. Table A.1. Auxiliary heat exchanger geometry calculations.

Can ternary eutectic chloride salt be used for solar power?
On the Path to SunShot: Advancing Concentrating Solar Power Technology, Performance, and Dispatchability Assessment of a novel ternary eutectic chloride salt for next generation high-temperature sensible heat storage Energy Convers. Manage., 167 (2018), pp. 156 - 164, 10.1016/j.enconman.2018.04.100

The solar-powered devices for sodium hypochlorite generation we have investigated can have an impact beyond disinfecting water for isolated communities, and spur further innovation in one of the major electrochemical operations worldwide. This framework demonstrates that large, centralized chlor-alkali facilities could benefit from transitioning to ...

Sodium chloride, anhydrous is a colorless crystalline inorganic compound highly soluble in water. Our Sodium chloride anhydrous,is suitable molten salt to prepare different types of eutectic mixtures due to its

high operation temperature for thermal energy storage (TES) materials and heat transfer fluids (HTFs) for next-generation concentrating solar power (CSP) systems.

The Liquid Pathway proposes the use of low-cost molten chloride salts for energy storage, mated with an operationally flexible solar receiver that employs liquid-metal sodium for heat capture and transfer to the storage salt. This approach leverages molten-salt technology from the current state-of-the-art CSP power towers embodied by plants ...

Results show that advanced CSP systems employing sodium and an indirect chloride salt storage can represent an economically viable solution and can drive towards the future goal of 5 USD/MWh....

Liquid sodium is widely recognised as an outstanding heat transfer fluid for thermal power generation systems, and in the context of concentrating solar power, is considered an enabler of ...

This study investigated the technical and economical operation of solar-powered sodium hypochlorite generators employing Si-based or GaAs-based PV technologies. The highest SCE ratios were obtained for MJ-driven devices, ...

With the integration of salt gradient solar pond hybrid systems, a maximum lower convective zone (LCZ) temperature of 90 °C, more than 50 % energy/exergy efficiency, and power generation of...

This work presents a techno-economic analysis of a sodium-chloride salt heat exchanger included in a sodium-driven CSP system with a supercritical CO2 power block. A quasi-steady state heat ...

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