

EXPERIMENTAL STUDIES ON SEASONAL HEAT STORAGE BASED ON STABLE SUPERCOOLING OF A SODIUM ACETATE WATER MIXTURE

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Experimental investigations of a 234 l seasonal heat storage module based on a salt water mixture consisting of 58% NaCH₃COO and 42% water as heat storage material have been carried out. The salt water mixture has a melting point of 58°C.

The investigations showed that the salt water mixture will supercool in a stable way if all salt hydrate crystals in the heat storage module are melted during the charge period, that a method to activate solidification of the supercooled salt water mixture using boiling CO₂ in a small tank attached to the outer surface of the heat storage module is reliable, that the heat content of the heat storage module is as high as theoretically calculated, and that the durability of the heat storage module is good. The investigations also showed that the heat exchange capacity rate to and from the heat storage module is too low, and that heat transfer areas of the heat storage module are too small.

Based on the investigations, a new 300 l flat heat storage module with increased heat transfer areas will be constructed. It is hoped that the new heat storage module will have good thermal characteristics inclusive sufficiently high heat exchange capacity rates.