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Discussion of regenerator for cryogenic energy storage

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Developing and utilizing energy storage technologies means a significant push for the "Smart Grid". Pumped hydro storage and compressed air energy storage have been proved useful in the field of large scale energy storage, however, to adopt liquid gas, e.g., air, as a storage medium could provide much higher energy density, reduce the cost and need for space considerably. In such storage system, the key device that builds the thermal equilibrium of the whole system is regenerator, which is designed for low temperature usage, and thus, influences the global efficiency markedly. Generators for large-scale cold energy storage commonly employ packed columns that consist of hollow tanks and fillers within these tanks, and the characteristics of such packed columns mainly determined by the fillers'density, specific heat, flow resistance, etc., as well as the shape of such hollow tanks. Based on the discussion of former researches, the factors that influence the efficiency was analyzed in this paper.

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