Preheating of a battery module in an EV

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The use of lithium-ion batteries for electric vehicles (EVs) shows excellent promise due to their outstanding properties regarding high energy and power densities, long service life, low self-discharge and rare pollution. However, the performance and life cycle of such batteries depend on the operating temperature as they are extremely sensitive not only to high but also to low temperatures. The climatic conditions of Kazakhstan and in particular, the north part of the country are quite extreme. Temperatures may drop below -40ºC in winter time. For a battery pack of an EV to perform in the most effective way, temperature management is very important. The proposed thermal management system will maintain a battery pack at an optimum average temperature range with an even temperature distribution throughout the module. In this part of the work particular attention paid to the preheating process.

Evaluation of Wall Material Admixture Threshold Values in Burning Zones of Fusion Devices

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One of the problems of fusion devices is wall material right selection that depends on the research purposes. In various fusion devices the admixture of wall or shell material could present in fuel mixture affecting the burning nature. The electronic component of admixture creates additional radiation losses, then use of low Z material allows reducing them, however ionic component could be involved in producing energy. Both loss and gain depend on the temperature value. Also one should consider tolerance to high temperature. In this work we try to evaluate an admixture's approximate threshold value that still could allow to keep the burning efficient at extreme conditions in traditional reactors as well as in specific ones for different fusion fuel types. It is obtained that the most capable fuel type DT allow up to several dozens percent of admixture in fuels concentration to be present at extreme conditions. The obtained values will be useful upon selection of suitable wall material.