

HEAT PIPES – GOOD TOOL FOR FUEL CELLS THERMAL MANAGEMENT

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ABSTRACT

A question of energy production and efficient consumption is of greatest importance for world ecological and economic development strategy. Numerous difficulties concerned with decrease of fossil fuel reserves determine onrush of new technologies dealing with application of alternative renewable energy sources and systems of energy regeneration.

Fuel cells are promising energy sources due to its performance coefficient (40–60 %), environmental safety and high reliability. Nowadays extensive production and wide deployment are constrained by expensive value of manufacturing technology, materials and catalysts cost, which are mostly caused by novelty and insufficiency of researches at given area.

For the most efficient and steady functioning of fuel cells special conditions are necessary. It is important to ensure required temperature of incoming reagents, uniform temperature distribution on bipolar plates surface and removal of releasing heat from fuel cells stack. Heat pipes use phase change phenomenon and are able to solve these problems owing to its extremely high thermal conductivity coefficient, low thermal resistance and absence of additional energy consumption. Depending on power dissipation in variety of constructions of fuel cells different types of researched and developed heat pipes may be used (micro and miniature heat pipes (1–100 W), loop, pulsating, sorption heat pipes (100–1000 W)).

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