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A Review on Temperature Reduction Management and Heat Management System to be Implemented in High Temperature Proton Exchange Membrane Fuel Cell

G V Thakre[1], Om Urkande[2], Yogesh Mahantare[3]
Department of Mechanical Engineering[1,3]
PG Scholar, Department of Mechanical Engineering[2]
Bapurao Deshmukh College of Engineering, Wardha, Maharashtra, India

Abstract: *Commercialization of technology of PEMFC (proton electron membrane fuel cells) remains a big obstacle regardless of the broad research on PEM and other fuel cells.High temperature proton exchange fuel cell has found its wide application now days and it is very important to manage the Heat and apply cooling arrangement for the fuel cell stack as durability is at stake when exposed for the longer duration. Considering the heat sources HT-PEM has three heat sources: 1) irreversible joule heating caused by the charge transport in the solid electrolyte or the conductor 2) Reversible heating due to the charge entropy change and 3) irreversible heating of the reaction caused due to the over potential. Considering all the aspect it is found that the optimum temperature for HT PEM Fuel cell is 170℃ to 180℃ though it is observed that at 200℃ the efficiency has shown positive effect. The enormous heat generated by the electrochemical reaction of the fuel cell as a by-product and when it reaches to the extreme limit of the recommended temperature which makes cooling necessary and based on the FC power the cooling strategy is to be implemented accordingly, Even though there are many methods for cooling but the medium through which the cooling takes place is restricted to 2 i.e. Air and Liquid..*

Keywords: Proton Exchange Membrane Fuel Cell, Irreversible Joule Heating, Reversible Heating, Irreversible Heating, Cooling, Heating

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