具開放式陰極之質子交換膜燃料電池之最佳化研究

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摘 要

以直流風扇送風的開放式陰極質子交換膜燃料電池，利用風扇推送空氣，使之貫穿陰極流道，此空氣則兼具『反應氣體』與『冷卻流體』的雙重功能。此種型式的燃料電池系統，具有構造簡單、體積小、重量輕等優點，因此諸如電動輪椅、電動代步車、電動自行車等小型運輸工具，很適合以它做為電力來源。 具有開放式陰極的質子交換膜燃料電池，除了它所使用的膜電極組（MEA）的優劣將左右其性能之外，雙極板中陰極的空氣流道和流速之設計，對電池堆的操作溫度以及整體性能亦有關鍵性的影響。 本論文針對這種型式的燃料電池堆進行研究，利用COMSOL數值分析軟體模擬的方法深入探討質子交換膜燃料電池的陰極，在各種不同的流道設計與空氣流速下之電池性能以及燃料電池內部之溫度變化情形。

關鍵詞 : 質子交換膜 ; 燃料電池 ; 數值模擬

目錄

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