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Altri autori (Persone)	WangHaijiang Henry YuanXiao-Zi LiHui <1964->
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Sommario/riassunto	Compared to other electrochemical power devices such as the battery, the PEM fuel cell is much more complicated. Its complexity derives from the following aspects: 1) Most of the components are composite materials. 2) Porous materials must be used for gas and water transport. 3) Nanomaterials have to be used to achieve high electrochemical activity. 4) Complicated processes take place within the fuel cell in addition to the electrochemical reactions, such as the transport of electrons, protons, reactant gases, product water and vapor, and heat. 5) The electrode reaction occurs at a multi-phase boundary and transport may occur across multiple boundaries. 6) Multi-phase flow happens in flow field channels and porous media. 7) The scale at which researchers have to look ranges from nanometers to meters. 8) Three-dimensional architecture is vitally important to performance and durability, due to the large size of PEM fuel cell stacks. 9) Local performance can seriously affect the system's

performance and durability. 10) There are complicated operating conditions, such as load, temperature, pressure, gas flow, and humidification--