

论文

质子交换膜燃料电池金属双极板的腐蚀与表面防护研究进展

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摘要:

双极板是质子交换膜燃料电池(PEMFC)的核心多功能部件, 占据电池组重量和成本的绝大部分. 目前PEMFC双极板材料主要有石墨、金属及相关复合材料. 与石墨类材料相比, 金属材料在强度、抗气体渗透、规模化生产及加工成薄板以提高电池比功率等方面显示明显优势, 但其面临的主要挑战是腐蚀问题, 这导致电池性能下降. 为此, 国内外围绕金属双极板的腐蚀与防护问题开展了广泛研究, 并取得了长足进展. 本文对此进行了简要评述.

关键词: 质子交换膜燃料电池 金属双极板 腐蚀与防护

A REVIEW ON CORROSION AND PROTECTION OF METALLIC BI POLAR PLATES FOR PROTON EXCHANGE MEMBRANE FUEL CELL

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Abstract:

Proton exchange membrane fuel cell(PEMFC) is considered as one promising clean and highly efficient power conversion system with wide applications, such as portable power, automobiles as well as on site power generation system. Bipolar plates are a key multifunctional component of PEMFCs, accounting for a significant part of total weight and cost of the PEMFC stack. The candidate materials investigated for bipolar plates so far include graphite, metals and composites. Metals exhibit higher mechanical strength, no gas permeability, much superior manufacturability, and can be machined to be thin plates to achieve the higher power density when compared to graphites. The main disadvantage of metals, however, is the corrosion in PEMFC environments, which causes considerable power degradation. Thus, the corrosion and protection of metals in PEMFC environments have received wide attention, with great progresses. This paper makes a brief review of the research works on metallic bipolar plates.

Keywords: proton exchange membrane fuel cell metallic bipolar plates corrosion and protection

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