

عنوان مقاله:

Construction of Composite Polymer Bipolar Plate for Fuel Cell

محل انتشار:

دومین کنفرانس بین المللی کامپوزیت (سال: 1389)

تعداد صفحات اصل مقاله: 6

نویسندگان:

Ehsan Zarmehri - Graduate Student

Morteza Sadeghi - Assistant Professor

Arjomand Mehrabani-Zeinabad - Professor
Department of Chemical Engineering, Isfahan University of Technology,
Isfahan ۸۴۱۵۶-۸۳۱۱, Iran

Mahmoud Meratian - Associate Professor

خلاصه مقاله:

Bipolar plates play the most significant role in weight, volume, and corresponding costs of fuel cells. Initially, metallic and graphite materials had been used for production of bipolar plates due to their electrical conductivity characteristics. Later, these plates due to their deficiency such as corrosion, weight, and production expenses were appropriately substituted by composite plates. This article presents results of a study on construction of bipolar plates using conductive polymeric composites. In the constructed composites, polypropylene was implement as polymer matrix, and conductive carbon black and graphite as filler in order to supply the required electrical conductivity. The added fillers have been distributed in polypropylene by using an internal mixer. Then, bipolar plate specimens were prepared by molding of composite in hot press. The prepared specimens have been characterized to evaluate their specifications such as mechanical properties, and their performance properties like thermal and electrical conductivities. The results of performed tests have shown a good performance on thermal conductivity greater than 10W/m.K, electrical conductivity higher than 10S/cm, and high mechanical strength, flexural strength greater than 25MPa. The constructed composite plates were optimized and their weight in comparison to similar metallic plates 80%, and in contrast to graphite plates 40% were reduced. This method for production of bipolar plates is more economical as it reduces the cost of used materials and expenses of manufacturing operations.

کلمات کلیدی:

Fuel cell; Bipolar plates; Composite; Polypropylene; Carbon black; Graphite

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/102730>



