عنوان مقاله:

Mechanical and chemical characteristics of the PEM fuel cell sealants in simulated environment

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خلاصه مقاله:

Sealants are one of the most important components of the proton exchange membrane fuel cells (PEMFCs). It has significant roles in issues like safety, energy density, durability and performance of the fuel cells. Thus choosing the proper kind of the sealant which is suitable for PEMFCs may cause to develop the performance of the fuel cells. Sealants must be chemically and physically stable in order to have good performance during the defined lifetime for the fuel cell. The durability of the seal means that it has the ability to be placed in the environment of the fuel cell for a long time, and its physical and chemical properties changes should be small, and performs the sealing function correctly. In this paper, mechanical properties of three different types of materials that are frequently used for fuel cell sealing are assessed in an environment similar to the fuel cells ones. These three materials are silicone, EPDM (ethylene propylene dyne monomer) sheet, and molded EPDM. Mechanical properties of the materials are obtained after being used in environment resembling a fuel cell at specific time and temperature. The mechanical and chemical properties of the specimens such as are hardness, weight changes, tensile strengths, compression set and spectrometry are carried out in accelerated durability test of simulated PEMFC environment. These tests are gathered in the period of ۱۰۰ days. The results revealed that the molded EPDM is the best sealant from others based on the obtained properties in fuel cell working conditions.

کلمات کلیدی:

Durability test, mechanical properties, PEM fuel cell, Sealant