A Feasibility Study of Using Plastic Bipolar Plates in Fuel Cells

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ABSTRACT

The bipolar plate of PEMFC's is made of graphite plate by using milling machines, which makes the cost of bipolar plates constitute a large portion of that of fuel cell stacks. Furthermore, more than 80% of the weight of a fuel cell stack comes from the bipolar plates. Although researchers in the field of fuel cells have conducted so much R&D work relevant to the bipolar plate technology, good solutions to this problem is still yet to come. The present project proposes a novel design of bipolar plates which can be formed by injection or compression molding process using plastic materials and a current collector can be inset on its surfaces . The current collector together with the gas diffusion layer can conduct electrons easily under certain operating conditions and stack designs. The main purpose of the present project is to investigate the feasibility of applying the plastic bipolar plates in the Air-breathing PEMFC's. We will conduct the related experiments and computer simulations to validate the application of this innovation in fuel cells. Hopefully, in the near future the plastic bipolar plates can be used to reduce the cost of fuel cells.

Keywords : PEM ; Fuel cell ; Bipolar plates

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