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Study of electrode ink rheology and coating quality for pem fuel cell application DONGLEI YANG, ABEL CHUANG, Univ of California - Merced — Proton Exchange Membrane (PEM) fuel cell is one of the most promising energy conversion devices that are environmental friendly. It converts chemical energy stored in hydrogen direct to electricity with only water and heat as by-products. These reactions take place in the electrode layer, which is most commonly made from ink coating and drying process. The electrode ink, consists of polymer/binder, inorganic catalytic particles and dispersant media, is therefore an important component that has a significant impact on fuel cell performance and durability. Most existing literature investigated the electrode film after coating and drying regarding its structural, material and electrochemical perspectives by altering the ink composition. Little attention has been paid to understanding the ink due to its highly opaque and heterogeneous nature. In our work, we focus on three aspects: 1) characterizing the rheological properties of the electrode ink; 2) assessing the dispersibility of the electrode ink by the means of zeta-potential; and 3) evaluating the relation between ink rheology and the coating quality.

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