289ae Iron and Cobalt Supported Au Catalysts for the Selective Oxidation of Co

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The selective oxidation of CO is an important reaction in the generation of hydrogen for proton exchange membrane (PEM) fuel cells. CO acts as a poison to the Pt anode of the PEM fuel cell, decreasing power output and efficiency. The CO concentration from a reformer/water-gas shift unit is typically 1 mol% and must be reduced to below 100 ppm to maintain efficiency. Thus, having a catalyst with high selectivity and activity for CO oxidation in the presence of large amounts of hydrogen is critical.

Previous studies have shown that the use of gold supported on mixed oxides containing iron and cobalt can be active and very selective without for the oxidation of CO at temperature between 95°C and 150°C. Pretreating the catalyst with steam or low temperature reduction resulted in increased catalyst activity. Results suggest that the presence of Au increases the activity and selectivity but higher activity at lower temperatures could be obtaining by decreasing the Au particle size. This paper discusses gold supported on mixed oxides of iron and cobalt for the selective CO oxidation reaction. Specifically, the effect of the preparation method, catalyst pretreatment, and support composition on the activity and selectivity were investigated. The results of kinetic studies are also reported.