

Public Abstract

First Name:Ahmed

Middle Name:Mohammed

Last Name:Jasim

Adviser's First Name:Yangchuan

Adviser's Last Name:Xing

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title:Enhancing Methanol Electro-Oxidation Activity Using Tin Oxide Clusters on Doped Titanium Dioxide

Due to environmental issues from oil burning and other pollutant sources, people have started seeking for other approaches that are environmentally friendly and cost effective. Direct methanol fuel cells (DMFCs) are one of the most efficient power sources that have the potential to be used in portable electronic applications, co-generation systems, and the automobile industry. They have unique advantages, such as the ability to directly convert chemical energy into electrical energy with efficiency up to 70% and generate less polluting emissions. One of the technical barriers lies in the catalyst to accelerate methanol electro-oxidation.

Such obstacles are the high-cost catalyst when it used in high metals loading. Such metals are platinum, palladium, and other precious metals. Herein, we report less platinum loading (20%) with some cheap metal oxide as a synthesized catalyst. Usually, a catalyst has to show high activity, long durability, and considerable stability inside the fuel cell. The prepared catalyst showed most of them, in particular, the stability and the activity.

The prepared catalyst could improve the fuel cell car technology in term of cost of car price, in addition; making the fuel cell car more practical. Furthermore, this catalyst could be embedded in power co-generation system to generate the power.