**Title :** Using biochar as a support material for the preparation of anode catalysts for low-temperature fuel cells.

**Author(s) :** **1.** Apinya Srikulna **Student ID :** 650510122

**Major :** Chemistry

**Advisor(s) :** **1.** Associate Professor Dr. Surin Saipanya

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# ABSTRACT

In this work, low-cost platinum-based electrocatalysts for methanol oxidation were developed using commercial carbon black (CB) and biochar derived from corn-stover, an abundant agricultural waste, via pyrolysis at 700°C. The biochar provides a sustainable, renewable, and low-cost alternative to conventional carbon supports. Pt nanoparticles were deposited on the supports via chemical reduction. Electrochemical evaluation in 0.5 M methanol + 0.5 M KOH shows that Pt/biochar and Pt/CB–biochar catalysts exhibit lower onset potentials than Pt/CB, indicating limited electrical conductivity of biochar, while Pt/1CB–3Biochar achieves a favorable balance of current density and activity. Chronoamperometry reveals stable current over 3600 s, confirming good durability. FT-IR analysis demonstrates that biochar possesses functional groups similar to those of commercial carbon black. These results indicate that biochar is an acceptable and sustainable catalyst support for methanol oxidation, and that performance can be improved through conductive additives, although further modification is required to match commercial carbon black.

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