

## Documents

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**Preparation and characterization of graphene film using biogas derived from oil palm empty fruit bunch (OPEFB) by chemical vapor deposition (CVD) method**

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**Abstract**

This study aims to fabricate graphene films using biogas derived from oil palm empty fruit bunch (OPEFB) as carbon precursors using chemical vapor deposition (CVD) method under various conditions. The fabricated graphene films were deposited on copper substrates at different temperatures and gas compositions. Scanning Electron Microscopy (SEM), Raman Spectroscopy, and the I-V test were used to analyze and characterize the properties of the fabricated film. From the characterization results, SEM images of films grown at 800 °C (without additional H<sub>2</sub> gas), and 900 °C (without additional H<sub>2</sub> gas) show a not so well-defined hexagonal domain shape with non-uniform morphology with variations in domain shape and orientation, while Raman spectra show it has only the D band and G band which are attributed to graphene oxide. On the other hand, at 900 °C (with additional H<sub>2</sub> gas), the SEM image shows more defined hexagonal domain shape and variations in domain shape and orientation, as well as the D, G and 2D band on the Raman spectra, which are like graphene with defects structure. Hence, it is concluded that graphene film was successfully produced at 900 °C with additional H<sub>2</sub> gas. © 2024 The Authors, published by EDP Sciences.

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