

Obtaining Graphene Oxide from Colombian Metcoke Using Liquid Phase Exfoliation (LPE) Method

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Abstract

This document describes the production of Graphene Oxide (GO) from metallurgical coke (metcoke) dust through the implementation of the Modified Hummers Oxidation method and the Liquid Phase Exfoliation (LPE) process [1]. The raw material is a coke breeze sample obtained from a Colombian coking company. **The primary objective of this project is to obtain GO from metcoke dust within the 150 to 100 μm size range and evaluate the resulting GO's yield and physical characteristics.** Considering the inherently low fixed carbon (FC) content of coke breeze [2], a crucial step involves subjecting the material to a physical wash in a JIG machine to concentrate the FC content [3] to ensure a high yield of GO. The acquisition of coke oxide is facilitated through the application of the Modified Hummers Oxidation method. Additionally, the LPE process incorporates Pluronic 123 to optimize the exfoliation of GO flakes. The combination of these techniques is pivotal in ensuring the successful derivation of high-quality GO from metcoke dust. Notably, researchers are exploring the potential applications of GO in industries such as construction, indicating the broader implications and utility of the derived material.

References

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- [2] R. Loison, P. Foch, and A. Boyer, *Coke Quality and Production*. 1989.
- [3] J. G. Speight, "The chemistry and technology of coal, third edition," *The Chemistry and Technology of Coal, Third Edition*, pp. 1–808, Jan. 2012, doi: 10.1201/B12497/CHEMISTRY-TECHNOLOGY-COAL-JAMES-SPEIGHT.

Figures

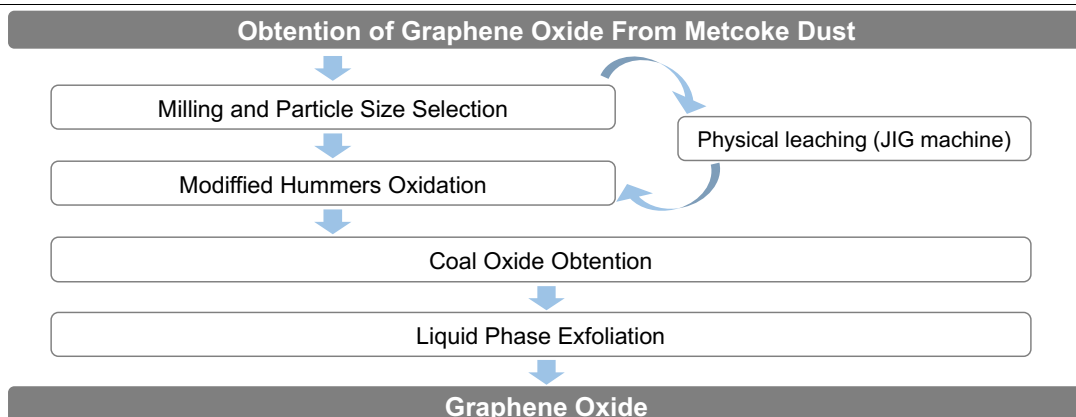


Figure 1: Scheme of LPE method to obtain graphene oxide from metcoke dust.