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## PROCEEDINGS

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## ANODIC ELECTROCHEMICAL EXFOLIATION OF VEIN GRAPHITE IN AQUEOUS MAGNESIUM SULFATE ELECTROLYTE

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### ABSTRACT

Anodic electrochemical exfoliation technique has the potential to produce exfoliated graphite through a cost-effective, simple and environmentally benign approach. This presents a study carried out on anodic electrochemical exfoliation of Sri Lankan vein graphite, in an aqueous medium with MgSO<sub>4</sub> as the electrolyte, to produce exfoliated graphite. In this study, a graphite rod cut from vein graphite was electrochemically treated using a Pt rod as the reference electrode and MgSO<sub>4</sub> as the electrolyte. Crystallographic and morphological analyses revealed an excessive volume increase in graphite layers caused by this exfoliation method. As a result, the sulfate anion could influence the migration of water molecules into the bulk of the graphite by allowing access to the graphite layers. Raman spectroscopic analysis showed that the defect density of the edge plane in graphite layers had increased from 0.48 to 1.38. Further, the particle size of the exfoliated graphite analyzed by the laser diffraction technique revealed a median particle size of 4592.9 nm with 1.197 of polydispersity index. Hence it indicates a highly oxidized and defective nature for this synthesized exfoliated graphite. Altogether, this study reveals the potentiality of producing exfoliated graphite from vein graphite, by this simple and cost-effective electrochemical exfoliation technique, with MgSO<sub>4</sub> as the electrolyte.

Keywords: vein graphite, electrochemical exfoliation, exfoliated graphite, magnesium sulfate