

E2-07 Chemical analysis of different types of Sri Lankan graphite

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Graphite is the most common allotrope of pure carbon. It takes the form of a black, soft solid. The demand for graphite has grown rapidly over the last five years. The graphite deposits of the world are waning whereas Sri Lanka has a promising future as an exporter due to the occurrence of natural graphite of high purity, in 2 large areas in the Central Highlands. This study was carried out using samples collected from Bogala and Kahatagaha-Kolongaha graphite mines.

According to the preliminary studies based on structural and physical appearance, 17 different forms of graphite were identified from Bogala, Kahatagaha-Kolongaha and Ragedara mines. Graphite found to occur in similar forms in Bogala, Kahatagaha-Kolongaha and Ragedara mines are: shiny slip fibres, coarse flakes (radiated) and striated coarse flaky. Other forms are needle platy and coarse flaky amorphous graphite and their variations. Fine flaky and amorphous graphite occur only in the Bogala mines.

The percentage of carbon in graphite was determined by fusion and chemical methods. The carbon percentage is high in shiny slip fibres graphite collected from the above mines. Impurities in graphite were determined using XRD and XRF methods. Strong peaks in the X-ray diffraction patterns were observed in the following types of graphite: shiny slip fibres, coarse flakes (radiated) and striated coarse flaky type. Si, Al, Ca, Mn, Zn, Fe and S are the major impurities according to XRF analysis. Microstructure of different types of graphite was examined using JEOL JSM-T 220A Scanning Electron Microscope (SEM). The SEM study showed that the above mentioned types of Sri Lankan graphite formed aggregates of microfibrils and microsheets.

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