

**PURIFICATION OF SURFACE GRAPHITE FROM
PASSYALA, SRI LANKA**

A dissertation submitted to the
Faculty of Science & Technology
Uva Wellassa University

In partial fulfilment of the requirements for the award of the
Degree of Bachelor of Science

by

**RATHNAYAKA MUDIYANSELAGE UDARA
MADUSHANTHA SOMARATHNA**

**Mineral Resources and Technology Degree Program
Uva Wellassa University, Sri Lanka**

2014

Abstract

Flake graphite is the geologically most common variety of natural graphite. Surface graphite (flake graphite) deposits occur at South Western region of Sri Lanka. Even though there are various studies on Sri Lankan vein graphite, limited attention was drawn to study the surface graphite deposits in Sri Lanka. Present research was aimed to study the purification of flake graphite by using both chemical and physical purification techniques.

Flake graphite samples were collected from two abandoned mines in Pasyala area (Kaluaggala -Katawalla watta and Wawehena area). Particle size was reduced by using hammer and they were powdered using disk mill. Powdered graphite samples were sieved and purified using froth flotation. Samples were chemically purified using alkali roasting method. Series of NaOH was used. Carbon content of the purified samples was calculated. Electrical conductivity was measured (in room temperature) using Four-Probe DC electrical conductivity method. XRD and FTIR spectra were taken to study the structure of the graphite samples.

Final purity seems to be strongly depended on the initial purity. After single froth flotation, purity was increased in a high percentage. Sample with lower initial purity have obtained the maximum purity at relatively high NaOH concentrations.

Electrical conductivity values after the froth flotation are relatively high for graphite. Final electrical conductivity values are relatively lower. Removal of impurities which influenced the electrical conductivity can be the reason for these results.

It can be conclude that it is possible to purify low grade surface graphite (flake graphite) to obtain high purity graphite (97.98% C) using these method. Froth flotation method can be used to achieve a significant purity enhancement level.

Key words – froth flotation, alkali roasting, conductivity, Surface graphite