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## **ABSTRACTS**

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## PRELIMINARY STUDY ON EXFOLIATION OF MICA FROM KAIKAWELA AND MAILAPITIYA, SRI LANKA FOR POSSIBLE INDUSTRIAL APPLICATIONS

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Biotite and vermiculite belong to phyllosilicate group of minerals with a unique structure having perfect basal cleavage. Biotite and vermiculite can be found in nature with a massive distribution in all sedimentary, metamorphic and igneous environments. Mica has very high economic value due to its number of uses. Industries such as electronics, automobile, chemical and fillers use mica as a raw material. Exfoliated mica is used for removal of oil in oceans, as absorbent of chemicals in storage containers, to produce health care products. Exfoliation behaviour of biotite and vermiculite has been studied for industrial use as well as for developing a filter to separate oil and water through the exfoliated type. Two mica samples were obtained from a feldspar quarry at Kaikawela, Matale, Sri Lanka, and vermiculite quarry at Mailapitiya, Sri Lanka for the preparation of exfoliated mica. A field study was carried in two areas to correlate the two mica deposits using petrology and literature. Selected samples were washed, ball milled and obtained grains < 1 mm by mechanical sieve shaker. Chemical treatment using hydrogen peroxide and thermal treatment were carried out using a furnace with different temperatures (300 °C, 600 °C and 900 °C) for preparation of exfoliated mica. The raw mica was also treated in a domestic microwave oven (900 W) for 10 minutes. Characterization of the mica and vermiculite samples was carried out with X-ray powder diffraction method (Cu K $\alpha$  Rigaku Ultima IV), fourier-transform infrared spectroscopy method (Nicolet 6700 spectrometer) and scanning electron microscopy (JSM 6400 Gemini Zeiss). In the presence of all the treatments, positive exfoliation potential was observed in vermiculites. For biotite, positive result was observed only under the thermal treatment done at 900 °C. The exfoliation depends on the particle size for both types, and further mica showed a higher exfoliation with respect to particle size increment. This prepared exfoliated mica can be proposed as a potential filter material to remove oil particles from water, especially suitable for the automobile service industry.

Keywords: Mica; Vermiculite; Exfoliated mica