

The Preliminary study of mineral chemistry in the Chilung Volcano Group



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Abstract

Chilungshan and Chilungyu igneous bodies belong to Chilung Volcanic Group (CVG) which is located in the eastern part of the Northern Taiwan Volcanic Zone (Fig.1). Previous research gave a magma mingling model in Chilungshan (Fig.2). In this study, we try to use mineral chemistry to study the phenocrysts of CVG. Mineral chemistry analyses were obtained on polished thin sections from these two locations and were determined at the Institute of Earth Sciences, Academia Sinica by using scanning electron microprobe (SEM) fitting with an energy dispersive spectrometer (EDS) and electronic microprobe analyzer (EMPA). The selected minerals are quartz, clinopyroxene, orthopyroxene, plagioclase, hornblende, and olivine.

In petrography observation, we can find quartz, plagioclase, orthopyroxene, clinopyroxene, hornblende, and some opaque in both areas. Hornblende and pyroxene show different occurrence between Chilungshan and Chilungyu (Fig. 3). According to our results of mineral chemistry (Fig.4 and 5), plagioclase in Chilungshan and Chilungyu belong to labradorite and bytownite, and some andesine can also be found in Chilungyu. Hypersthene and diopside can be found in both areas, however, augite only exists in Chilungyu. Some olivine existed abnormally in Chilungyu's sample (Fig. 6), and this occurrence might as a result of magma mixing as the previous model. However, we find no olivine in the thin section and there is no obvious difference composition between core and rim in all phenocrysts. Therefore, magma mixing might exist but not in the whole CVG.

Introduction

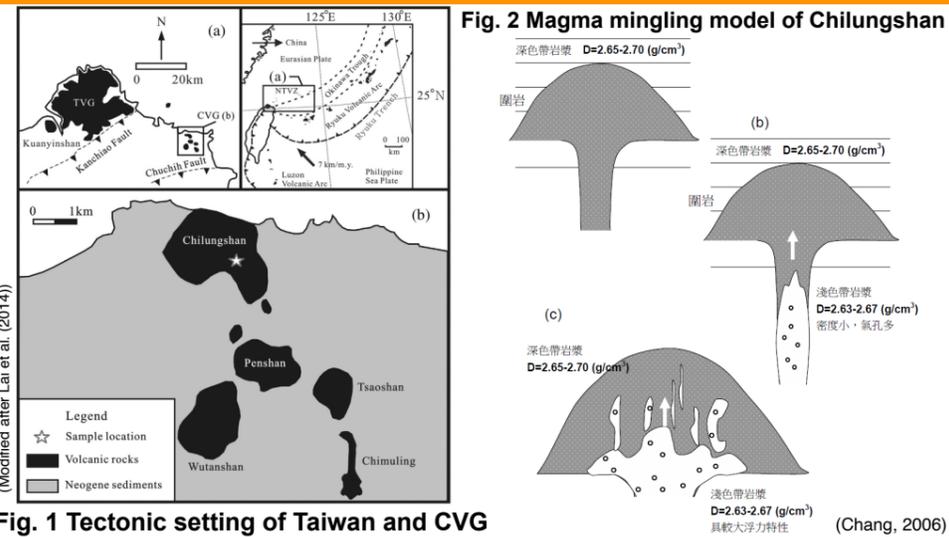
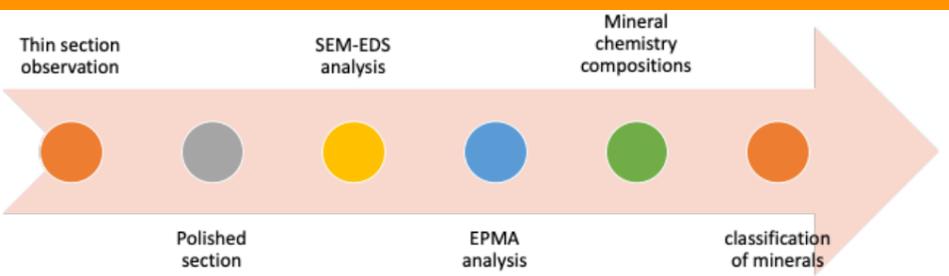


Fig. 1 Tectonic setting of Taiwan and CVG

Methods



Petrography

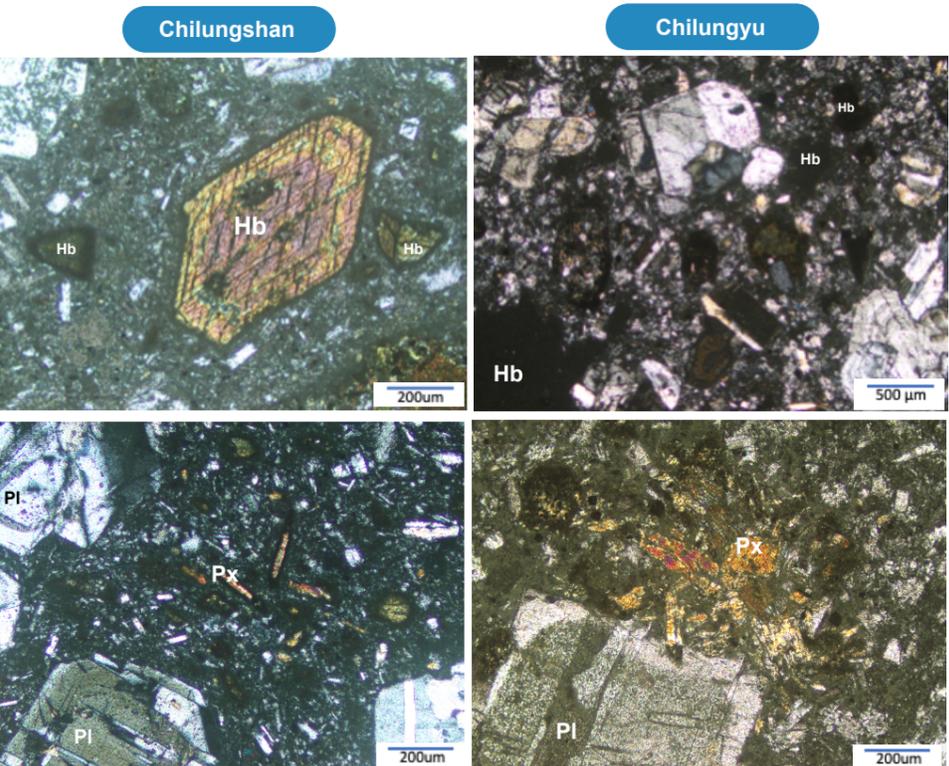


Fig. 3 Thin section of Chilungshan and Chilungyu

SEM-EDS Results

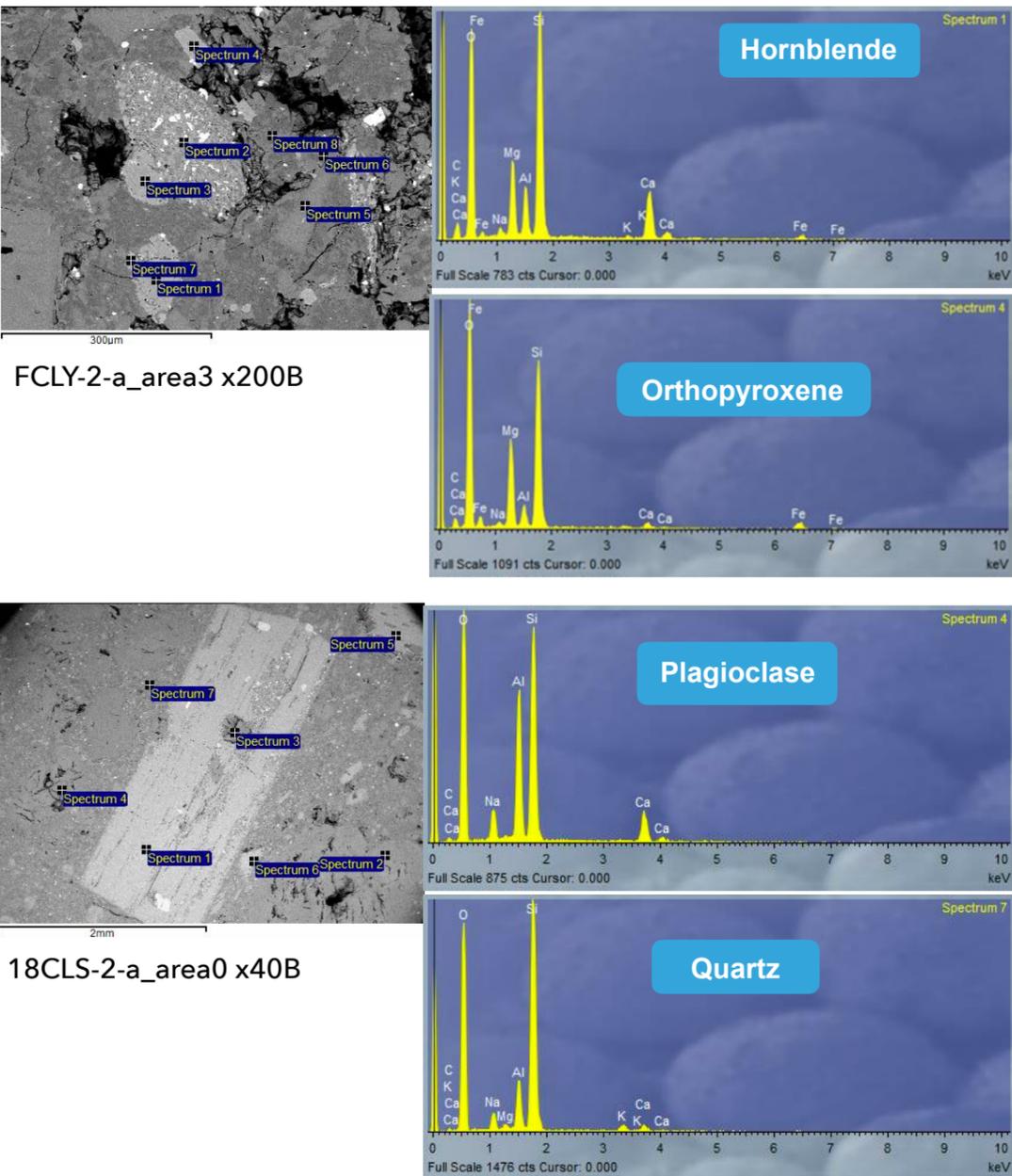
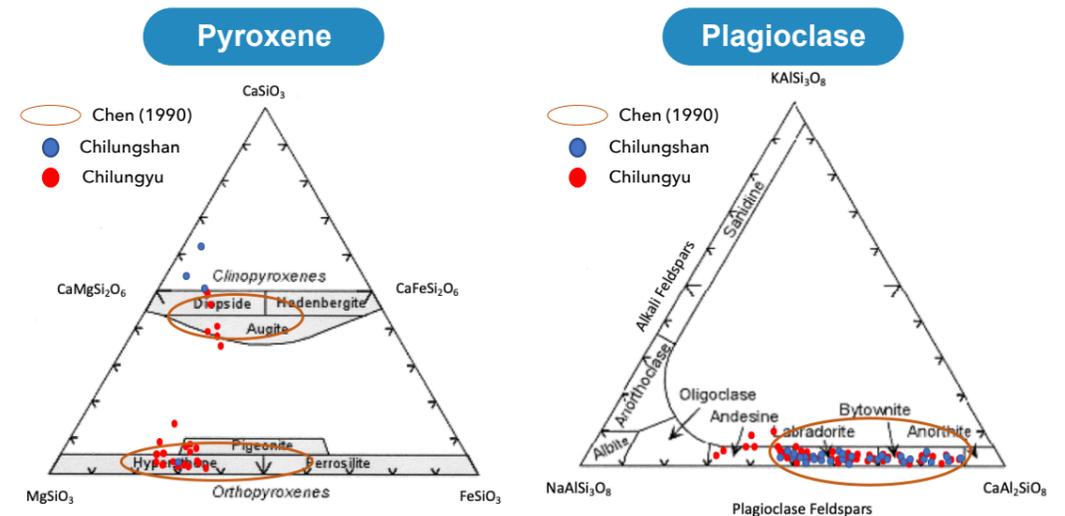


Fig. 4 SEM images and EDS diagrams of selected minerals

EMPA Results

Fig. 5 The classification of plagioclase and pyroxene



Olivine in Chilungyu

Location	FCLY-2-A	FCLY-2-B
Spot	Area5_21	Area4_17
Location of spot	Core	Core
Fo mole (%)	79.2	78.0

Fig. 6 The composition of Olivine

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