UNIVERSITY OF YANGON

DEPARTMENT OF GEOLOGY

MINERALOGIC, GEOLOGIC AND GENETIC ASPECTS OF CORUNDUM DEPOSITS, BAWPADAN-CHINTHE TAUNG AREA, MOGOK

NWE NWE OO

MAY, 2010

ABSTRACT

The Bawpadan-Chinthe Taung area lies in the northeastern part of the world famous Mogok Stone Tract of Myanmar. The main purpose of this study is to investigate the geologic, mineralogic and genetic aspects of corundum occurrences that enable for used as exploration guides and research works on other associated gemstone deposits throughout Myanmar. This work encompasses the detailed field investigation, thin section petrographic study, major and trace element geochemical analyses of rocks and mineral samples and inclusion study of corundum by using Laser Raman Spectroscopic technique.

Geologically, the study area falls within the Mogok Metamorphic Belt (MMB) lying between Sagaing Fault and Shan Scarp, consisting of medium to high-grade metamorphic rocks and intrusive igneous rocks. The Bawpadan-Chinthe Taung area comprises mainly gneisses, marbles and calc- silicate rocks locally intruded by alkaline dykes and granites. Many aplite and pegmatite dykes, quartzofeldspathic and quartz veins also intruded into the Mogok Metamorphic Belt.

Based on the petrographic examination, number of (30) mineral assemblages were recorded representing the metamorphic rocks of the study area. These mineral assemblages indicated that two types of metamorphic facies: upper amphibolite facies, in the case of regional metamorphism (P-T range: 600-750°C, 4-8 kb) and pyroxene-hornfels facies for contact metamorphism (P-T range: 600-700°C, 1-2 kb). The ruby bearing marble bands strikes 160° with 60° E dip, mainly consisted of coarse-grained crystalline marble with phlogopite, diopside and graphite which are considered to be regional metamorphic origin belonging to the upper amphibolites facies.

The major and trace element analyses of corundum megacrysts and Laser Raman Spectroscopy for inclusion studies were carried out for better understanding in postulating the genesis of corundum deposits. The value of (Cr/Ga and Fe/Ti) in ruby indicates that the formation of ruby is a consequence of high-grade regional metamorphism especially in the upper amphibolite facies of calcareous rocks enriched in aluminum relative to silica, chromium and titanium.

The Laser Raman Spectroscopic analyses revealed that mineral inclusions, calcite, muscovite, apatite, sericite, biotite, welgarite, orthoclase, unidentified sulphate minerals and chabasite by LRS method. CO_2 are a vapour (gas) phase in most rubies. Inclusions of chabasite and a small daughter crystal were also identified as diaspore. The presence of diaspore, sericite and other sulphate mineral inclusions also indicate that the ruby in marble was formed from metamorphism of clayey bands in the original limestone, the main aluminum source for ruby. The ruby bearing bands are also concordant to the regional foliation trend of marble. Apatite inclusions in ruby also indicate that fluorine probably acted as an activator for aluminum mobilization during pneumatolytic metamorphic process leading finally to the formation of ruby.