

指導教授 葉孟宛

題目二

玉山山脈南段沈積岩層熱變質度之估算

The application of Raman Spectroscopy as Geothermometer for the Southern Yu Shan belt, Taiwan

相較於中高度變質岩，低度變質岩與沈積岩之地溫計算較為不易，近年來因運用拉曼光譜針對石墨烯的研究使得拉曼光譜於地質的應用得以拓展。由於沈積岩內含有大量的碳物質。在沈積物經過深埋過程中因地溫梯度而受熱，使得其中的碳物質改變其成分和結構，而進行碳化與石墨化之轉變。進而建立了碳質拉曼光譜溫度計。台灣的抬昇速率相當快速，且因快速的抬昇會導致地質破碎與不穩定之狀況，因此，本研究將針對於玉山南段所採集之沈積岩與低度變質岩樣本進行拉曼光譜分析，以探討此研究區域岩石所記錄之溫度演化史。進而瞭解玉山南段之抬昇速率估算質為何。

Temperature in which a rock form /metamorphosed is important in exploring the history of its evolution. Taiwan is known to have the fastest uplift rate in the world, which has potential of bringing some geohazards, such as landslide and rapid flood. Therefore, it is important to examine the vertical evolution of the rock in order to track uplift and exhumation in Taiwan. The area of study, Yu Shan, is the highest mountain in Taiwan, it is very suitable for this study because the high altitude reflects the high uplift rate, making it one of the areas with highest uplift rate in Taiwan. Most of the metamorphism that had happened in Southern Yu Shan is low-grade metamorphism. However, obtaining peak temperature for low-grade metamorphism can be very challenging, especially when the host rock is a sedimentary rock. In addition of lacking index minerals, the lack of reliable geothermometer for low-grade metamorphism also account for this challenge. Therefore, a new different approach has been made recently to estimate the peak temperature for low-grade metamorphism. Raman spectra of carbonaceous material (RSCM) method has been proven to be a new reliable geothermometer. This project will utilize Raman spectra to obtain geothermometric information from sedimentary and low grade metamorphic samples collected from the southern Yu Shan belt.