

# **Analysis of clay mineralogy from the retrieved cores of Taiwan Chelungpu-fault Drilling Project, Hole-A**

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## **Abstract**

In order to understand the faulting mechanism for a particular fault, we can investigate physical and chemical properties of the fault zone by examining real materials of the fault zone. It is established way to evaluate the chemical reactions between fluid and rocks and the amount of heat occur in the fault zone via discussing the change of mineral assemblages within fault-related rocks. Clay minerals are well known as abundant contents in sedimentary rocks, and clayey transformation is also carefully and clearly examined in many previous studies to discuss the factors such as time, heat and ion exchange in clay interaction. Thus, analysis of clay mineralogy provides insights to obtain more precise information about the faulting mechanism and/or temperature, which is the most important parameter for calculating frictional energy.

Taiwan Chelungpu-fault Drilling Project (TCDP) was performed for many scientific purposes; one of them is to realize the faulting mechanism through analyzing the mineral assemblages within the fault zone. It is essential to know the origin of clay mineral assemblages existed in different formations as background data before comparing those of fault-related rocks with background level. In this study, we offer clay mineral relative contents within the Cholan Formation (500m-1027m), the Chinshui Shale (1027-1268m), the Kueichulin Formation (1268-1712m), and the

Cholan Formation (1712-2003m), respectively in TCDP Hole-A. Besides, we analyzed fault zone samples with carefully sequential sampling and compared their clay minerals with those of host rocks.

Above the depth of 1300m, clay minerals within small faults do not show significant changes instead of within the fault zones located at the depth of 1111m and 1153m, which are considered as candidates of the slip zone of Chi-Chi earthquake. Below 1300m depth, relative clay mineral contents only change slightly between fault-related rocks and host rocks, suggesting that clay minerals may not play a major role of controlling the faulting mechanism of the Sanyi fault system.