Transition of melt-fluid infiltration along detachment fault sampled from deformed gabbroic rocks and amphibolites of initial and final stages on the Godzilla Megamullion, Parece Vela Basin, Philippine Sea

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Detachment faults within oceanic core complexes interprets to act as conduits for fluid migration into deeper parts of the oceanic lithosphere. Thus, such detachment faults may influence underlying magmatism, hydrothermal activity and the rheology of oceanic lithosphere. In this study, to investigate the relationship of melt-fluid infiltration along detachment faults, we focused on the amphiboles in gabbroic rock and amphibolite because amphiboles are common hydrous minerals within oceanic gabbroic rocks and are generated by magmatic and metamorphic processes. We represent the results of microstructural and major- and trace-element analyses of amphiboles in the deformed gabbroic rocks and amphibolites sampled from two dredge sites (KR03-01-D6 and -D10) on the Godzilla Megamullion, and these two sites correspond respectively to the initial (i.e., breakaway area) and final (i.e., termination area) stages of development of the Godzilla Megamullion. Furthermore, we also compare the melt-fluid infiltration along the detachment fault between each dredge site. Amphiboles are classified into four distinct groups (Bleb, Coronitic, Matrix in brown amphiboles and Green amphibole) based on the microstructural and compositional classifications from Harigane et al., (2019, Lithos). We believe that these results at each stage might have been linked to entirely understand magmatic and hydrothermal circulation processes during detachment faulting of the Godzilla Megamullion.

Keywords: amphibole, gabbroic rock, amphibolite, detachment falut, Godzilla Megamullion, oceanic core complex

