R004-18
Zoom meeting A ：11/4　PM2　(15:45-17:30)
16:15-16:30

古地磁気・岩石磁気学的手法を用いた被熱温度推定：第四紀後期以降の溶岩の数値年代決定への貢献

#安　鉉善[1)],Kim　Jin Cheul[2)],Lee　Jin Young[2)],Hong　Sei Sun[2)],Lim　Jaesoo[2)],Sohn　Young Kwan[3)],Cho Hyeongseong[3)]
[1)]高知大,[2)]韓国地質資源研究院,[3)]慶尚大

Application of paleo-and rock-magnetic determination of heating temperature: A contribution to late Quaternary lava chronologies

#Hyeon Seon Ahn[1)], Jin Cheul Kim[2)], Jin Young Lee[2)], Sei Sun Hong[2)], Jaesoo Lim[2)], Young Kwan Sohn[3)], Hyeongseong Cho[3)]
[1)]Kochi Univ,[2)]KIGAM,[3)]Gyeongsang Nat'l Univ

Precisely dating Late Pleistocene-Holocene volcanic eruptions is essential for disclosing spatio-temporal frequency distribution of ancient volcanism and assessing volcanic eruptions probability in a volcanic field. However, such precise dating in volcanic fields is often difficult due to the lack of appropriate chronological approach. Such difficulty is being encountered in the Jeju volcanic field, where there are sedimentary deposits that are intercalated with volcanic units. For an aim to provide and examine a new alternative technique for numerical age determination of lavas and other volcanic products that were emplaced at high temperatures, we have carried out Ar radioisotopic dating, radiocarbon (14C) dating, optically stimulated luminescence (OSL) dating and a suite of paleo-and rock-magnetic analyses on a pair of a lava bed (a candidate of “young-aged" eruptions) and underlying unconsolidated sediments in Jeju Island. The Ar isotopic dating was performed with the step heating technique by using groundmass separates of lava rock samples, the 14C dating was performed with accelerator mass spectrometry by using humic acid extracts of bulk sediments, and the OSL dating was performed with the single-aliquot regenerative-dose procedure by using fine (4?11 micro m) quartz separates of bulk sediments. The paleo-and rock-magnetic analyses that were performed on both of the lava and sediment beds were designed in order to detect the occurrence of paleo-heating by the lava emplacement in the sediments and provide quantitative estimations of the heating temperatures, which are based mainly on progressive thermal demagnetization experiments of natural remanent magnetization and repeated magnetic susceptibility vs. temperature measurements with increasing peak temperatures.
The lava Ar isotopic dating could yield a plateau age of 15 +/- 5 (1 sigma) ka, which has a relatively large uncertainty. On one hand, the 14C and OSL dating show distinct differences in age-position profile for the sediments from each other, of which particularly the OSL ages clearly exhibit a concentration at around 15 ka, independent of the sample positions. The paleo-and rock-magnetic results reveal that the sediment samples at positions where the OSL ages were determined had experienced heating by the upper lava leading to reaching temperatures of 200?250 degree C and higher, which could result in the zeroing of OSL signals at the time of the lava emplacement. From these OSL ages, we could obtain a weighted mean age of 14.8 +/- 0.8 (1 sigma) ka, which is in good agreement with but clearly indicate a high-precision determination with respective to the lava Ar plateau age. Consequently, we suggest that the lava-heated sediment OSL dating with such magnetic analyses herein shown can be a feasible, new dating approach for improving chronology of the late Quaternary volcanism.