

K-Ar ages of Samalas-Rinjani volcano cluster, Lombok: pre-caldera variation from migrating to stationary activity.

TOSHIDA, Kiyoshi^{1*} ; TAKADA, Akira² ; KITSUKAWA, Takashi³

¹CRIEPI, ²AIST, GSJ, ³Ceres, Inc.

K-Ar dating of Pliocene to Quaternary lavas consisting large volcanoes in Lombok are preformed to determine the active periods of Samalas-Rinjani volcano complex (VC) prior to the caldera eruption in 1257 CE. In order to accurately date the hand specimen of young lavas, non-spiked argon ratios are analysed to estimate the amount of mass fractionation of argon isotopes at the time of solidification of the lavas. Consistent ages were obtained for replicate analyses of the four young lavas from Samalas in the range of 0.08-0.04 Ma. Two samples are estimated to have initial argon ratios that are fractionated from atmospheric values. The ages form distinct groups that correspond to the active periods of volcano clusters: 2.7 Ma and 2.0-1.8 Ma for West Lombok VC, 0.5-0.4 Ma for East Lombok VC and 1.0 Ma to present for Samalas-Rinjani. Samalas-Rinjani system should be defined as single volcano complex based on the relative duration of each active period. Rinjani and the current activity of Segara Anak caldera are correlated to the younger stages of Samalas-Rinjani. The location of volcanism has been relatively stable for the past 0.4 million years in both Lombok and Sumbawa, which hosts Tambora volcano. Caldera-forming eruptions of the two regions (the 1257 eruption and the 1815 eruption at Tambora) occurred at the volcanoes with 1000 km³ class edifice that had formed through 0.1 to 0.2 million years of volcanic activity. This contrasts clearly with the migration of volcanic activity from 5 to 0.7 million years BP in the two regions.

Keywords: Quaternary, caldera, Indonesia, Sunda arc, radiometric dating, mass fractionation correction method