

Major element chemistry of volcanic glass from tephras around Pacayal Volcano in the eastern El Salvador, Central America

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In the mountainous area of the department of Usulután, El Salvador, Central America, stratovolcanoes are concentrated; Berlin-Tecapa, Tabulete, Usulután, El Tigre, Chinameca-Pacayal, San Miguell-Chaparrastique. In the area, many pumice layers deposited for the last 100, 000 years are known, called Blanca Rosa, Jucuapa-1, -2, and -3, Twin/Las Gemelas, Unit/Unidad-A, Jucuapa-4, Pacayal-1, -2, -3, and -4, in ascending order, as shown in fig. 1. This study aims at revealing the characteristics on major element chemistry of these tephras to differentiate them from other tephras and to trace them in other area. For the purpose, chemical composition of volcanic glass from these tephras was analyzed using a wave-length-dispersive electron microprobe analyzer (WDS) in the laboratory of Prof. Siba, Department of Earth and Environmental Science, Hirosaki University, resulted as follows;

1) By the difference in major element chemistry, the tephras in the area can be distinguished from other tephra originating Coatepeque Caldera in western El Salvador, or Ilopango Caldera in central El Salvador.
2) Major element chemistries of the tephras in the area were concentrated to four clusters, as shown in fig. 2. Most of the tephras belong to Cluster I that shows relatively K_2O poor and FeO and CaO rich chemistry. The Twin/Las Gemelas tephra and the Unit/Unidad-A tephra compose Cluster II, slightly higher in K_2O and lower in FeO and CaO than the chemistry of the Cluster I. The chemistry of the Blanca Rosa tephra and the Jucuapa-4 tephra forms Cluster III, plotted in the area where K_2O is higher and FeO and CaO is lower than the Cluster II. Only the Pacayal-1 tephra belongs Cluster IV that shows clearly unique chemistry of lower FeO and higher SiO_2 than other tephras while the K_2O value is similar to that of the Cluster III.

Keywords: tephrochronology, WDS, major element analysis

