Dissolution rate and weathering process of porous rhyolites from Izu-Kozu-Island

Tadashi Yokoyama [1], Jill . F. Banfield [2]

[1] Mineralogical Institute,Tokyo Univ, [2] Department of Geology and Geophysics University of Wisconsin-Madison

To estimate the actual dissolution rate in the field, four glassy rhyolitic dome lava samples from Kozu Island, different in age (about 1,100, 2,600, 20,000, 40,000(yB.P.))were studied. The initial chemical compositions of the four lavas were nearly equal, so the change of chemical compositions of the four lava over time can provide weathering rate information. Observation with SEM and TEM reveals the existence of an altered layer composed of halloysite and allophane. The effect of inflow from outside was corrected by assuming Fe was conserved. The dissolution rate was calculated by plotting the change of chemical composition against time(1.9*10^-18moles/cm2/sec). This value is 10^-3 lower than experimental dissolution rates of rhyolitic glass, measured at 25C and pH7 in closed system.