

CHLORINE AND FLUORINE IN BONINITES AND SANUKITES

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Concentrations of chlorine in more than 490 and fluorine in 360 samples of boninites and related andesites and dacites from the Bonin Islands, and sanukite series rocks from the Seto Inland Sea and Kyushu areas, Japan, have been analyzed.

The boninites from the Bonin Is. have high Cl contents, with a mean value of 402 ppm, while their F contents are generally low, giving a mean value of 105 ppm, despite their high water contents up to 6 %. A group of brecciated andesite from the northwestern part of the island is depleted in Cl but not F which is also depleted in water. The boninites in the Bonin Is. occur as pillow lavas, breccias and dikes, in which the pillow lavas are the most enriched in Cl. The marginal glasses of the pillow lavas have about 1.4 times higher Cl than their core. Cl contents of the boninite series rocks increase as differentiation proceeds from boninite through andesite to dacite. These features are less pronounced or not found for F.

Cl contents of the sanukite series rocks, with a mean value of 178 ppm, are lower than those of the boninites. On the contrary, concentrations of F in the sanukites, with a mean value of 308 ppm, are apparently higher than in the boninites despite their low water contents.

These results suggest that origins of water introduced into the boninite and sanukite source mantles are different.