

Chemical composition of ferrocolumbites in Ishikawa-yama granitic pegmatites, Fukushima, Japan.

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Unique chemical evolution of ferrocolumbites from Ishikawa-yama granitic pegmatites, Fukushima Prefecture, Japan, has been revealed by electron probe micro analyzer (EPMA). The compositions of Ferrocolumbites are different among sample locations, which are within about 1km distant each other. Three main trends in compositional variations in ferrocolumbites have been established: (1) a homogeneous crystal trend, with Ta/(Ta+Nb) being low, (2) a trend with oscillatory zoning, related to Ta, Nb, Ti and a tendency toward Ta-enrichment in the growth stages, and (3) a trend with patchy zoning, related to Fe, Mn, Ti. This fractionation in patchy zoning is interpreted to reflect the higher crystal field stabilization energy of Fe²⁺ relative to Mn²⁺. The compositional trend varies from ferrocolumbite to tantano-ferrocolumbite, then shifts toward mangano-ferrocolumbite. This fractionations in ferrocolumbites from granites of the Japanese island arc differ from those observed in beryl pegmatites of the continents.