THE NATURE OF FLUID MIGRATION IN THE METAMORPHIC MARBLES

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We can find a distincitive chemical fronts between skarns and carbonates in a contact and regional metamorphic aureoles where an intensive material transport took place during their formations. A highly space resolution analyses of carbon and oxygen isotope ratio in calicte marbles developped by Wada and others (Wada 1988, Arita and Wada, 1990, Satish, et al., 1998, Wada et al., 1998) make it possible to fully understand such influences on metamorphic marbles. Cathodoluminescence (CL) image can also help to offer visual information about the fluid passways in such marbles. We have examined some different types of marbles with a skarn formation collected from some contact metamorphic aureoles in Japan (Wada et. al., 1998), a regional metamorphic terrain in Antarctica and Southern India (Satish et al., 1998) and a contact followed by regional metamorphism in Adirondacks (Wada and Valley, 1998). Diffusion controled profiles can be observed in around a low pressure metasomatic wollastonite reaction front in a marble of the Hida metamorphic terrain, central Japan, display a typical metamorphic fluid-enhanced isotopic zonations. The chemical reaction cut the oxygen isotopic profiles and newly produced a profile with diffusion controled reaction in a contact zone from Hiroshima, Western Japan.. Solution-precipitation : Across a 1.2-mm-wide domain, a calcite crystal from a granulite facies marble from East Antarctica exhibits microscale oxygen isotope heterogeneity that has been enhanced by channelized fluid flow (Satish et al., 1998). Our results provide important evidence for the mechanism of isotope-exchange between fluids and minerals and have major implications for microfracture-controlled fluid-flow processes in the Earth's crust.