G122-P010 **Room: Poster Session Hall** **Time: May 20**

Lithogical control on calcite precipitation within the veins from the Sanbagawa metamorphic belt

Keisuke Morohashi[1]; Atsushi Okamoto[2]; Noriyoshi Tsuchiya[3]

[1] Environmental,Tohoku Univ; [2] Tohoku Univ.; [3] Environmental Studies, Tohoku Univ.

Sealed cracks (mineral veins) in high pressure metamorphic rock are records of fluid-filled cracks deep within the subduction zone. Thus, the analyses of mineral veins provide information on fluid flow, fluid-rock interaction and the origin of. Fluid. In this study, mineral modes and textures within mineral veins that exist in the chlorite zone in the Nagatoro area of Sanbagawa metamorphic belt, Kanto mountains. Especially, we focus on the spatial distribution of calcite ($CaCO_3$)-bearing veins that is concerned with CO_2 fluid to understand the in fluence of vein size and the host rock type on precipitation of calcite from H_2O-CO_2 fluid within the subduction zone.

The investigated outcrop is exposed over the area of 20 m (E-W) x 200 m (N-S), and is composed mainly of pelitic and psammitic schists, with minor siliceous basic schists. Pelitic schists are composed of quartz, albite, chlorite, muscovite, epidote, graphite, and titanite and often contain calcite as a layer, whereas basic schists of quartz, albite, muscovite, epidote, actinolite, titanite and calcite. The veins commonly develop in N-S direction and cut the foliation at high angle. The number density of veins varies in both N-S and E-W directions, and the maximal density is 18 m-1. The vein width and length are commonly less than 1 cm and 100 cm respectively. The vein length increases with increasing the vein width, and the largest vein shows the width of 4.6 cm and length of 429 cm.

The vein is commonly composed of quartz, albite, chlorite, and calcite, but the modal abundances of vein minerals varies significantly. The reactions with respect to dropped hydrochloric acid (HCl) to veins in the outcrop revealed that calcite-bearing veins are common in basic schists. The volume proportion of calcite (Mcal = Area occupied by calcite x 100 / Area of vein) within individual veins was measured in thin sections of pelitic, siliceous, and basic schists, respectively. The calcite-rich veins (Mcal is no less than 40 %) are rare in pelitic and siliceous schists, and calcite is absent for the half of the analyzed veins. In contrast, basic schists commonly contain the calcite-rich veins (Mcal is no less than 40 %). These observations indicate that the mineral assemblage and mode of veins are strongly controlled by host rock type even in the same outcrop. Calcite was preferentially precipitated in veins cut through basic schists rather than pelitic schists or siliceous schists.

There are two possibilities to explain the preferential precipitation of calcite. First, CO_2 fluids came into cracks and reacted with Ca^{2+} dissolved from the host rock to precipitate calcite. Basic schists contain abundantly Ca-minerals such as epidote, actinolite and titanite, and have higher Ca content than pelitic schists. The preferential formation of calcite-rich veins in basic schists may have reflected the Ca contents in the host rocks. The second is that calcite that primary existed in the host rock were dissolved, and re-precipitated within vein. In this case, influx of the external CO_2 fluid is not necessary for the vein formation. In the Sanbagawa schists, calcite-rich veins occur not only in calcite-rich basic schists but in calcite-poor ones, indicating that the former scenario is more likely than the latter.

Combining the future studies on the vein texture and fluid inclusion using Raman scattering spectroscopy with the modal abundance of calcite as described above, we will discuss the fluid flow and evolution of the compositions of H_2O-CO_2 during vein formation.