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Rocks of samarskite structure in a metamict ABO₃ mineral and its high-temperature transformations

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Abstract: The results of the annealing experiments at high temperatures are presented for an amarskite phase with wolframite-type structure (space group $P_2_1/c$, $a$ = 5.63 A). The samples were quite well oriented for the analytical techniques used.

To ensure the presence of coesite and its transformed polymorph, quartz, in UHP rocks and to confirm the relics of the phase transformation, crystal structures were analyzed by single-crystal X-ray diffraction and by using the rock thin section mounted on a slide glass. The rock sample used is a coesite-bearing eclogite in the Sulu UHP terrain, eastern China. The crystal structures were successfully determined by this new method and the presence of coesite and quartz in UHP rocks are identified for the first time by X-ray diffraction. The R(1) converged to $0.046$ for coesite and $0.087$ for quartz. The displacement ellipsoids for coesite and quartz are larger than that previously reported for these phases. The crystal structures determined by this new method for different conditions in an Ohmi-Itoigawa region; coesite occurs as secondary veins in jadeite. Strontio-orthojoaquinite is a typical accessory mineral in jadeite and it is observed as a complex chemical composition. Strontio-orthojoaquinite is a composition of two monoclinic units with a twinning relation on (001). This structural property is based on the fact that strontio joaquinite structure has pseudomirror plane on the twin crystals.

Varieties Sr-bearing minerals occur in tectonic block such as jadeite from serpentinic melange exposed at Ohmi-Itoigawa region. Six Sr-bearing new minerals from this area have been reported. Crystal structure of reengeite and strontio-orthojoaquinite have been determined, however we carried out HRTEM observation and reexamination of the original samples, but no differences were small, so HRTEM method is useful for these fine-grained minerals. The crystal structure of reengeite and strontio-orthojoaquinite has been determined by this new method. The crystal structures of these two minerals are different in conditions in the same Ohmi-Itoigawa region; reengeite occurs as secondary veins in jadeite. Strontio-orthojoaquinite is a typical accessory mineral in jadeite and it is observed as a complex chemical composition. Strontio-orthojoaquinite is a composition of two monoclinic units with a twinning relation on (001). This structural property is based on the fact that strontio joaquinite structure has pseudomirror plane on the twin crystals.


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Reexamination of reengeite and strontio-orthojoaquinite from Ohmi-Itoigawa region, central Japan by TEM

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