International Session (Oral) | Symbol S (Solid Earth Sciences) | S-CG Complex & General

[S-CG08_29AM1]Collision, Subduction, and Metamorphic processes-II

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Tue. Apr 29, 2014 9:00 AM - 10:45 AM 311 (3F)

This session is the continuation of last year's JPGU 2013's international symposium "Collision, Subduction, and Metamorphic processes". The symposium is aimed at considering the processes involved with the continental collision, slabs subduction and related metamorphic processes. The multi-disciplinary approach will be applied to extract the information preserved in various rocks and minerals via structural, geophysical, petrologic, geochemical and experimental studies. These include formation processes of new minerals/textures, their growth history and recrystalization, inclusion morphology, and metamorphic reactions. Topics related to rocks and minerals formed in the processes of continental collisions, oceanic subductions, and regional metamorphisms are most welcome from the major orogenic belts worldwide. Topics in this session also include links between hydration and dehydration along the subduction channels, cycling of continental crust, deformation mechanisms in the subduction, collision regimes, formation and exhumation of various metamorphic rocks such as granulites, blueschist and HP/UHP eclogites and other metamorphic rock types.The session also aims at exchanging ideas among geoscientists applying different approaches on problems related to the subducting slabs, collision boundaries and related metamorphic processes. New works with novel or interdisciplinary techniques to the related theme are especially welcomed.

9:00 AM - 9:15 AM

[SCG08-P04_PG]3 types of Ca-Amp found from Nove Dvory UHP eclogites and their origin, Moldanubian Zone of the Bohemian Massif

3-min talk in an oral session

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The upper-stability limit of Ca/Na amphibole (Amp) in meta-mafic rocks are considered to be around 2-3 GPa in pressures (Schmidt &Poli, 1998). Thus, most Ca-Amp in (ultra)-high pressure metamorphic rocks have been considered as retrograde products. The peak metamorphic conditions of Nové Dvory eclogites are estimated to be 4.5-4.9 GPa and 1050-1150^{o}C. However, some Ca-Amp inclusions in Grt are likely to be interpreted as prograde relicts survived the ultra-high pressure metamorphism. This paper reports the mode of occurrence and the chemical compositions of Ca-Amp and the coexisting minerals in Nové Dvory eclogite, and discusses when Ca-Amp crystalized. Investigated two eclogite samples, ND0107 and ND120, collected from the same outcrop, are composed mainly of garnet (Grt) and Omphacite (Omp) with minor amounts of apatite (Apt) and rutile (Rt) at the UHP stage, and suffered hydration reactions, represented by Ca-Amp and plagioclase (Pl) formation, with various degree during the exhumation stage. Ca-Amp in studied eclogite can be classified into 3 types based on their modes of occurrence; Type 1 Amp occurs in sporadic euhedral shaped polyphase mineral aggregates (PMAs) in Grt along with Omp, Rt, and Apt. Type

1 Amp is identified only from ND0107, and is classified as pargasite (Prg) or kaersutite (Krs). Omp inclusions associated with Type 1 Amp are homogeneous and have high X_{Jd} of 40-45, suggesting that the associated Omp did not suffer retrogressive reactions. On ACF diagram, Type 1 Amp is plotted between the associated Omp and host Grt. It suggests that Type 1 Amp could be a relict of the following reaction, Amp=Omp+Grt+W, during the subduction stage. Type 2 Amp is identified as a member of PMAs in Grt along with spinel (Spl) and diopside (Di). Those PMAs with Type 2 Amp show unidiomorphic shapes and straight alignment in Grt. They are classified as Prg or magnesio-hastingsite (Mg-Hs). Type 3 Amp is a member of the symplectite along with Omp. Di, Spl, and Pl developed at Grt rim. These facts suggest that Type 2/3 Amp were formed during the exhumation stage reacted with infiltrated fluids to the host eclogite.The different stage origins of Type1/2 Amp mentioned above is supported by F and Cl contents in them. Type 1 Prg contains 0.21-0.30 wt% of F, but is almost free from Cl (A, ^{IV}Al, and $^{VI}Fe^{2+}$ can incorporate more Cl (Makino, 2000). However, Type 1/2 Amp have a similar major element compositions such as $(Na+K)^{A}$=0.79-0.95 pfu (for O+OH+F+Cl=24 basis), ^{IV}Al=2.01-2.45 pfu, and $^{VI}Fe^{2+}$=0.56-0.97 pfu, in spite of a scarce but significant difference in Cl content among them. Cl-free Type 3 Amp contains similar amount of $(Na+K)^{A}$ (0.75-0.96 pfu) and ^{IV}Al (1.95-2.38 pfu), but less in $^{VI}Fe^{2+}$ content (