[JJ] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS11]Crustal Structure

convener:Yasuhira Aoyagi(Central Research Institute of Electric Power Industry)
Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
The aim of this session is to cover seismological and geophysical studies on the Earth's crust. Contribution on seismological and geophysical structure of the crust, processes that develop in the crust which include earthquakes, volcanoes and geological descriptions of the crust are welcomed. We also welcome theoretical and methodological studies that will serve as basics in such explorations.

[SSS11-P14]Petrography and thermometry on mafic xenoliths from Takashima and Kurose, North Kyushu, Japan

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Ultramafic and mafic xenoliths are found within alkali basalt in Takashima and Kurose in North Kyushu, Japan. Although ultramafic xenolith has been studied well for understanding situation of the mantle under Southwest Japan (e.g., Ishibashi, 1970; Arai et al., 2001), mafic xenolith has been less studied. However, they may provide the heterogeneous structure of the lower crust precisely by their comparing. Therefore, mafic xenoliths were collected from Takashima and Kurose and analyzed to get information of the lower crust. And then, the situation of the lower crust was considered by estimating the equilibrium condition of coexist pyroxenes in mafic xenoliths.

The gabbroic xenoliths collected from Takashima were grouped into two types: 2Px-gabbro and Cpx-gabbro, according to their mineral assemblages and their abundance. On the other hand, the gabbroic xenoliths collected from Kurose were grouped into two types : Spl-gabbro and 2Px-gabbro. In gabbroic xenoliths from Takashima, Mg# of pyroxene is 81-86. It is noticed that Al_2O_3 contents increase and CaO contents of Cpx decrease gradually from core to rim. This variation may indicate the increase of pressure during Cpx coarsening. On the other hand, any Opx have no variations of composition in their grains. In gabbroic xenoliths from Kurose, Mg# of pyroxene in Spl-gabbro (Mg#=82-86) is higher than that in 2Px-gabbro (Mg#=71-76). No compositional variation was found inside of each mineral in gabbro from Kurose. Such occurrence probably shows that they coarsened during stable pressure/temperature condition at Kurose.

For advanced understanding of the lower crust, equilibrium temperatures of pyroxene were estimated by two-pyroxene thermometry estimated by Wood and Banno (1973, WB) and Ishibashi and Ikeda (2005, II). In the gabbro from Takashima, estimated temperature of 2Px-gabbro (1060-1100℃ by WB; 1000-1060℃ at 10 kbar by II) was not different from that of Cpx-gabbro (1070℃ by WB; 1010℃ at 10 kbar by II). On the other hand, in the gabbro from Kurose, estimated temperature of Spl-gabbro (1040-1060℃ by WB; 940-1000℃ at 10 kbar by II) was higher than that of 2Px-gabbro (940-980℃ by WB; 850-940℃ at 10 kbar by II). The difference of the temperature of Kurose xenoliths indicate Spl-gabbro locates deeper than 2Px-gabbro at the lower crust under Kurose.