

## Origin of atmospheric dust and the associated anthropogenic lead around Omura Bay, West Japan

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In order to evaluate the responsibility of the cross-border pollution to the atmospheric environment in West Japan, we measured the trace element concentration and Sr-Pb isotope ratios of aerosol particles collected at the eastern hill of Omura Bay with temporal high resolution from May 2011 to June 2012. The acid-soluble component of the aerosol samples contain more than 10 times the amount of Cd and Pb than the residual dust components contain. This suggests that these elements are mainly of anthropogenic origin. The <sup>87</sup>Sr/<sup>86</sup>Sr of silicate component is high in winter and spring (0.712-0.714), and is lowest in summer (0.706). These high and low ratios are typical of Asian dust and the local sediment, respectively. The seasonal change is considered to reflect the difference of dominant wind direction between winter and summer. Although the correlation between <sup>87</sup>Sr/<sup>86</sup>Sr and soluble Cd and Pb ( $r > 0.7$ ) suggests that the anthropogenic components are transported with the Asian dust, the isotope ratios of soluble Pb (<sup>206</sup>Pb/<sup>207</sup>Pb: 1.16, <sup>208</sup>Pb/<sup>207</sup>Pb: 2.44) suggest that their origin is Japan in spring, when much amount of Asian dust arrives, while those in fall and winter (<sup>206</sup>Pb/<sup>207</sup>Pb: 1.13-1.15, <sup>208</sup>Pb/<sup>207</sup>Pb: 2.42-2.43) suggest far-east Russian and/ or Central Asian origin. Perhaps because dust particles act as adsorbent, lead concentration is highest in the season of Asian dust. Cross-border pollution is highlighted in winter when the coal combustion for heating is at the peak under the wintry atmospheric pressure pattern around East Asia.

## Melting history of the Pozanti-Karsanti ophiolite, Turkey: Implications from whole-rock and mineral compositions

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Pozanti-Karsanti ophiolite, from the eastern Tauride, Turkey, is represented by mantle unit and overlying crustal sections composed of ultramafic to mafic cumulates and isotropic gabbros. Harzburgitic to dunitic mantle peridotites are characterized by low Al<sub>2</sub>O<sub>3</sub> (0.11–1.01 wt%) and CaO (0.10–1.07 wt%) contents. The low whole rock Al and Ca values are consistent with their high Cr# of spinel values, ranging between 44 and 78. These spinels are generally have low TiO<sub>2</sub> (<0.06% wt%) contents, although spinel in some samples show enrichment up to 0.25 wt%. Chondrite-normalized whole rock and clinopyroxene REE contents show depletion towards HREE to MREE. However, all peridotite samples show marked enrichment of LREE compared to MREE. Both whole rock and clinopyroxene HREE patterns of some peridotite samples follow the melting residue lines, and are modeled ~25–27 fractional melting in spinel stability field. However, depletion of MREE compared to HREE is stronger in some samples and the HREE to MREE patterns do not follow the melting lines produced by various degree of fractional melting in spinel stability field. These samples can be modeled by 5 to 10% fractional melting started at garnet stability field and followed in spinel stability field with additional 22 to 15% melting. The melting degrees obtained from whole rock and clinopyroxene REE data as well as spinel composition are consistent with each other, and confirm that the mantle unit of the Pozanti-Karsanti ophiolite is represented by up to 27% melting at different pressure conditions. The LREE enrichment observed in whole rock and clinopyroxene as well as higher TiO<sub>2</sub> contents of high-Cr# spinels in some samples do not suggest that the mantle unit of the Pozanti-Karsanti ophiolite is the simple melting residue. However, these feature of the peridotites is suggested to be due to the interaction of LREE and TiO<sub>2</sub> rich melts/fluids with formerly depleted peridotites. This interaction, taking place at suprasubduction zone environment, may increase the LREE contents of the peridotites and also cause the equilibration of Ti-depleted spinel to Ti-richer composition.