
**Carbon and Nitrogen Isotopic, and Mineral Inclusion Studies on the Diamonds from the Pozanti-Karsanti Chromitite, Turkey**

LIAN Dongyang1,* , YANG Jingsui2, Michael WIEDENBECK3, Alexander ROCHOLL3, Yildirim DILEK4 and WU Weiwei5

1 School of Earth Sciences and Engineering, Nanjing University, Nanjing 210000, China
2 Center for Advanced Research on the Mantle (CARMA), Key Laboratory of Deep Earth Dynamics of Ministry of Land and Resources, Institute of Geology, Chinese Academy of Geological Sciences, Beijing 100037, China
3 Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Potsdam, Germany
4 Department of Geology and Environmental Earth Science, Miami University, Oxford, USA
5 Faculty of Earth Sciences, China University of Geosciences (Wuhan), Wuhan 430000, China

**Abstract**

He Pozanti-Karsanti ophiolite (PKO) is one of the largest oceanic remnants in the Tauride belt, Turkey. Micro-diamonds were recovered from the podiform chromitites, and these were investigated based on morphology, color, cathodoluminescence, nitrogen content, carbon and nitrogen isotopes, internal structure and inclusions. The diamonds recovered from the PKO are mainly mixed-habit diamonds with sectors of different brightness under the cathodoluminescence images. The total δ13C range of the PKO diamonds ranges between −18.8 ‰ and −28.4 ‰, with a principle δ3C mode at −25 ‰. Nitrogen contents of the diamonds range from 7 to 541 μg/g with a mean value of 171 μg/g, and the δ15N values range from −19.1 ‰ to 16.6 ‰, with a δ15N mode of −9 ‰. Stacking faults and partial dislocations are commonly observed in the Transmission Electron Microscopy foils whereas inclusions are rather rare. Combinations of (Ca0.85Mn0.15)SiO3, NiMnCo-alloy and nano-size, quenched fluid phases were observed as inclusions in the PKO diamonds, confirming a natural origin of these diamonds. We believe that the δ13C-depleted carbon signature of the PKO diamonds is a remnant of previously subducted crustal matter. These diamonds may have crystallized in metal-rich melts in the asthenospheric mantle at depth below 250 km which were subsequently carried rapidly upward by asthenospheric melts/liquids. We concluded that diamond-bearing asthenospheric melts were likely involved in the formation of the Pozanti-Karsanti podiform chromitite.

*Corresponding author. E-mail:ldy199008@nju.edu.cn