NATIVE METALS Cr, Ni, AND α-Fe IN CRYPTOCRYSTALLINE DIAMONDS (CARBONADO) FROM YAKUTIA

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Several native metals have been found last years in different types of rocks. In natural diamond monocrystals have been established only three native metals: α-Fe, Cu and γ-Fe-Ni (taenite) [1]. Up to now there were no indication for native metals in carbonado - natural cryptocrystalline diamond.

We found three native metals : Cr, Ni and α-Fe (with 2-3% Cr) in carbonado from Yakutian kimberlite deposits. Two carbonado specimens are cryptocrystalline dark-gray agregate 5-8 mm consisting of micron size microindivids.

The metal inclusions in carbonado have been investigated by analytic transmission electron microscope JEM-100C (JEOL) equiped with goniometer and energy-dispersive spectrometer Kevex-5100 by suspension method.

Native Cr and α-Fe have been established in the more porous carbonado spesimen only while in the specimens without visible porosity Cr, Ni and α-Fe have been found. Cr is most abundant, then Fe and very rare Ni. Selected area electron diffraction (SAED) patterns and energy-dispersive spectra have been obtained from each particle of the metals.

The Cr characteristic elementary cell with a_0=2.88 ±0.03 Å and space group *Im3m*, for α-Fe a_0=2.86 ±0.03 Å (*Im3m*) and for Ni a_0=3.53 ±0.03 Å (*Fm3m*) have been measured.

The native metals in carbonado can be formed from magmatic melts with participation of reduction fluids.

REFERENCE

1 Gorshkov A.I., Titkov S.V., Sivtsov A.V., Bershov L.V., Marfunin A.S. (1995) First findings of native Cr,Ni and α-Fe in carbonado from diamond deposites of Yakutia. Geochemistry, N 4, 588-591 (in russian).