

THE APATITE COMPOSITION FROM THE DIFFERENT AGE BIFS OF VORONEZH CRYSTALLINE MASSIF AS A FLUID REGIME INDICATOR

K.A. Savko, S.M. Pilugin, M.A. Novikova

The apatite mineral paragenesis, morphology, and composition from the different age BIFs of Voronezh crystalline massif are investigated. Two apatite generations can be distinguished by composition and morphology in Mesoarchean BIF. The F-apatite was stable at the metamorphic peak of Mesoarchean BIF (> 900 °C) as fine inclusions in large pyroxene crystals. Metamorphic fluid was characterized rather high HF fugacity. The second generation apatite was crystallized during low grade (700 °C) second and third metamorphic events. It is occurred in paragenesis along with later garnet, grunerite, and chlorite. The second generation apatite is Cl-OH-apatite suggesting that fluid had aqueous-saline composition. This fact is verifying by the aqueous-salt fluid inclusions finding (1.9-4.9 % NaCl eq.). The F-apatite is stable at the Neoarchean and Paleoproterozoic BIFs. The apatite composition investigations suggest that the fluorine fugacities decreased from Mesoarchean to Paleoproterozoic in BIFs metamorphic fluid.