



Solid Solution of Pt-Pd with Bi-Te-As elements and possibility of new phases discovery background on the Monchepluton PGE Paleoproterozoic study.

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Pt-Pd phases of Bi-Te-As alloys, occur in virtually all known PGE deposits in the world, also evidenced by their naming, which refers to particular deposits, let us use, for example, merenskite, stilwaterite, moncheite. These minerals are an important source both for platinum and palladium as well as for tellurium. These phases are accompanied by sulphides among which they are usually located. Most often they are pyrite, pyrrhotite, chalcopyrite, pentlandite and many others. They form massive sulphide ore or are admixtures in ultramafic and mafic rocks in novae complexes of rocks containing PGE deposits in the world. It was made about 20. thousands of microanalysis in samples from selected PGE deposits (e.g. Sudbury, Monchepluton, Imandra, Fedoro-Panski, Imandrovski etc.). Analyzing the discussed alloys one can notice some regularities indicating that they can be part of a solid solution, which, depending on the conditions of crystallization, breaks down into individual phases. Careful observation of this process may shed light on the crystallization conditions of the discussed mineralization and indicate probable phases that should be tried or synthesized in the laboratory. This text is intended to indicate the anticipated phases and initiate their search among known deposits. The analysis of currently known minerals and their projection indicate that at least three extreme bismuth, tellurium, arsenide are possible in combination with platinum the more so that their counterparts exist in the case of palladium alloys and intermediate minerals such as merenskite and moncheite. It is possible that known minerals are the product of the breakdown of higher temperature and pressure phases as a result of reaction with the solution (Piela 2006, Kittel 1999, Subbotin et al 2017). The five-component system that is said solution is the key in understanding the method and conditions of the formation of alloys containing the present components. It is also possible that they are richer in other elements or allow a certain amount of "impurities" within the miscibility of alloys, contributing to the formation of atypical PGE mineralization also containing Pb, Ag and Se (Neradovski et al 2017). It is possible that these phases may have a cosmic character and become scattered and assimilated in terrestrial rocks during multiple processes of differentiation, gargoyle and anatexis accompanying intrusions of ultramafic rocks which disappeared into supracrustal rocks, which could contain such material. However, such conclusions are too early to write about it, although it cannot be ruled out that the study of Hadean rocks will shed light on this aspect as well.

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