

13th International Platinum Symposium

Abstracts

30th June - 6th July

Polokwane, South Africa



13th INTERNATIONAL PLATINUM SYMPOSIUM

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This abstract volume includes presentations of the 13th International Platinum Symposium focusing on different aspects of geology, geochemistry, mineralogy and exploration of various platinum-group element (PGE) deposits and occurrences from all over the globe, with particular focus this year on the Bushveld Igneous Complex. A variety of presentations cover discoveries and evaluations of mineralised areas, descriptions of the host rocks, characterisation of different platinum-group element assemblages and ideas on the processes that form PGE mineralisation.

The materials of the volume are of broad interest for geologists, earth scientists and students.

Pt-He DATING OF PLATINUM MINERALS FROM URAL-ALASKAN MASSIFS ITCHAIWAYAM AND MATYSKEN (KORYAKIA, RUSSIA)

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ABSTRACT. The Pt-He method was used to estimate the age of dunites and chromitites that host platinum mineralisation of Ural-Alaskan concentrically-zoned massifs of the Koryak-Kamchatka platinum belt, Far East Russia. Pt-He ages of isoferroplatinum from lode and placer deposits are 65 ± 4 Ma for Matysken and 74 ± 4 Ma for Itchaivayam massifs. We suggest that these are the most accurate determination of the ages of these rocks. The data confirms the previously stated assumption that these dunite-clinopyroxenite massifs and host picrites and basalts are comagmatic.

Ural-Alaskan concentrically-zoned mafic-ultramafic massifs are known as source of PGE. The time of formation of these dunite-clinopyroxenite massifs is difficult to date using traditional minerals-geochronometers especially when it comes to younger rocks.

Herein we applied the Pt-He method to estimate the age of dunites and chromitites that host platinum mineralisation of Matysken and Itchaivayam massifs (Koryak-Kamchatka, Russian Far East).

In the Koryak-Kamchatka region, Ural-Alaskan massifs form a narrow belt that stretches for about 1000 km from the central Kamchatka to the central part of Koryak highlands. The host rocks for the northern part of the Belt are mostly the arc-volcanics interlayering with jaspers and volcanoclastic rocks of Achayvayamskaya suite. According to biostratigraphy this suite belongs to Maastrichtian stage ($72.1-66.0$ Ma)^{1,2}.

Several attempts were made to determine the age of dunite-clinopyroxenite massifs of the Koryak-Kamchatka belt using traditional isotope systems: Rb-Sr, Sm-Nd, K-Ar¹. The most accurate results were obtained by Ar-Ar method on gabbro from the Epilchik massif (10 km from the Matysken massif) and give the age $75.7-71.6$ Ma (Razumny, unpublished data). However, despite the fact that this is the best isotope data available, the age of the massif turns out to be older than the host rocks, which contradicts the observed geological relationships: the gabbro

cuts the rocks of Achaiwayamskaya suite. Overvalue is apparently associated with the contribution of the trapped ⁴⁰Ar.

We have analyzed 11 grains of isoferroplatinum and native platinum from placers and lode deposits related to the Matysken and Itchaivayam massifs. Concentration of platinum was measured by VEGA-3 scanning electron microscope with an attached XMax 80 (Oxford Instruments) energy dispersion system with Aztec software (IVS FAB RAS). The total concentrations of platinum in the grains were calculated taking into account the amount of inclusions of native osmium and iridium. Concentration of radiogenic helium was measured on mass-spectrometer complex MSU-G-01-M (IPGG RAS) by the methodology described in Shukolyukov Yu et al³.

We had found no difference between ¹⁹⁰Pt-⁴He ages of the grains from lode and placer deposit of Matysken massif. Calculated by "isochron" method ¹⁹⁰Pt-⁴He age is 67 ± 4 Ma. ¹⁹⁰Pt-⁴He age of the Itchaivayam massif is slightly older at 74 ± 4 Ma. However, within the measurement error both massifs give a close age. A slight rejuvenation of isoferroplatinum from the Matysken massif may be due to an underestimation of the number of osmium and iridium inclusions.

The close ages of dunite-clinopyroxenite massifs of Koryak-Kamchatka belt and host basalts and picrites confirms the idea that these rocks are comagmatic (e.g. Batanova et al.)².

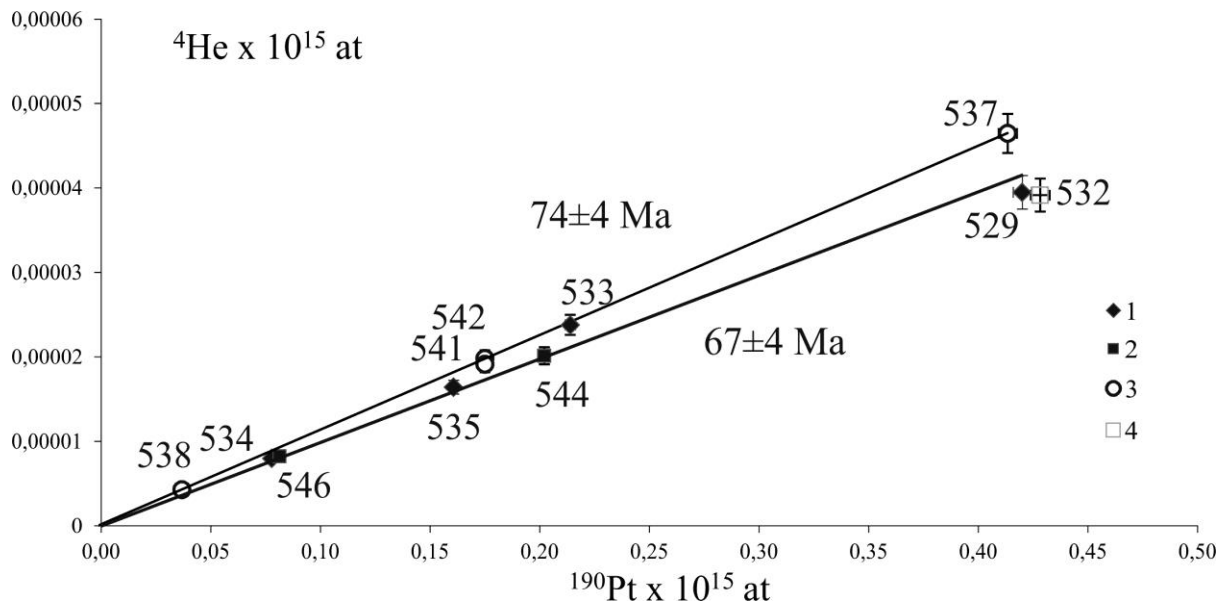


Fig. 1. Pt-He "isochron". 1 –Matysken (placer); 2 – Matysken (lode); 3 - Itchaivayam (placer); 4 – Matysken (measurement that was not taken into account for Pt-He age calculation).

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