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PLATINUM-GROUP ELEMENTS: PETROLOGY, GEOCHEMISTRY, MINERALOGY

PREFACE

The present thematic issue of *The Canadian Mineralogist* is a collection of 29 original research papers about the petrology, geochemistry, or mineralogy of deposits of the platinum-group elements (PGE). Most of these articles were presented orally at the 9th International Platinum Symposium that was held in Billings, Montana, USA, from July 25th to 29th, 2002. This highly successful meeting was organized by Roger Cooper, and attracted 204 participants from 19 countries. Field trips organized by Roger Cooper, Mike Zientek, Alan Boudreau, Moe Lavigne, Stu McCallum, Bill Meurer and Bruce Lipin were instrumental to the success of the meeting, which was held as a field conference of International Geological Correlation Program 427 (IGCP 427).

Interest in the geology of PGE deposits has never been higher than at present, because of a combination of burgeoning industrial applications such as catalytic converters or fuel cells in automobiles, relatively stable high prices, and diminishing reserves in some of the world's largest PGE mining camps, including the fabulous deposits of the Noril'sk district in Russia.

The issue begins with eight articles describing the petrology and petrogenesis of PGE-bearing rocks in a variety of igneous settings, ranging from the classic stratiform deposits of the Merensky and JM reefs (Polovina *et al.*, Smith *et al.*) to newer discoveries of stratiform mineralization in Sweden (Meurer *et al.*) and Canada (Desharnais *et al.*) and a variety of PGE-bearing base-metal-dominated systems from South Africa (Cawthorn & Kruger), Spain (Ortega *et al.*), Egypt (Helmy) and China (De Waal *et al.*).

In the second section, there are three papers presenting new models and experimental data relating to the transport of PGE by aqueous fluids. Boudreau provides

a free software application that permits the user to model the transport of PGE by deuteric fluids in cooling igneous cumulates, whereas Zhmodik *et al.* describe the pattern of behavior of Ir in hydrothermally synthesized base-metal sulfide minerals, and Wood *et al.* present experimental evidence for the transport of PGE as organic complexes under ambient conditions during weathering.

The remainder of the issue is devoted to three subsections in which the minerals of the PGE (*i.e.*, PGM) are described for assemblages observed in igneous rocks, placer deposits, and hydrothermal deposits. PGM from stratiform deposits in layered intrusions are described from the Merensky Reef (Prichard *et al.*), and the Lakkulaivaara and Imandra intrusions of Russia (Barkov *et al.*). Two new mineral species are described, an unnamed sulfide from the Penikat intrusion of Finland (Barkov & Fleet) and tarkianite, from the Hitura mine, also in Finland (Kojonen *et al.*).

From a description of the composition and mineralogy of chromitite-hosted mineralization in a Uralian setting (Zaccarini *et al.*), we move into discussions of detrital PGM from placer districts in the Bushveld (Oberthür *et al.*), Russian Far East (Shcheka *et al.*, Tolstykh *et al.*), and the locality hosting what is perhaps the oldest placer deposit of all, the Witwatersrand Basin of South Africa (Malitch & Merkle).

The occurrence of PGM in rocks clearly of hydrothermal origin has tended to be neglected in the past, and we are pleased to include four articles describing their paragenesis in a very large VMS deposit (Vikentyev *et al.*), a greenstone-hosted vein-type Au deposit in Canada (Olivo & Theyer), and the extraordinary Pd alloys and Pd-O compounds of Minas Gerais, Brazil (Cabral *et al.*).

We are deeply indebted to a small army of referees who provided at least two thorough, thought-provoking and constructive reviews of each manuscript. Some manuscripts were accepted with few changes, but others required extensive revision to maintain the high standards of *The Canadian Mineralogist*. As usual, it was a delicate balancing act to orchestrate this, but all of the authors and reviewers alike provided what was required in a spirit of generous cooperation. The entire project could not have been possible without the guidance and

skill of Editor Bob Martin, who provided us with the gracious mixture of tactful advice and firmness required to make things happen on time, and carried out his customarily detailed, precise, and substantive copy-editing on every manuscript.

James E. Mungall,
guest editor

The University of Toronto

William P. Meurer,
guest editor

The University of Houston



Participants on the post-meeting field symposium 100 m west of the top of Chrome Mountain at the Stillwater intrusion, Montana. 1 S. McCallum, 2 J. Mungall, 3 N. Irvine, 4 J. Hanley, 5 M. Ogasawara, 6 P. Thurston, 7 Unidentified, 8 M. Houle, 9 R. Latypov, 10 C. Vaillancourt, 11 S. Boorman, 12 D. Ohnenstetter, 13 A. Mitchell, 14 C.M. Leshner, 15 J. Kruger, 16 W. Meurer, 17 M. Zientek, 18 R. Sproule, 19 M. Ohnenstetter, 20 S. Gregory, 21 A. Peregoedova, 22 A. Boudreau, 23 S. Wood, 24 C. Tegner, 25 R. Lee, 26 D. Mooney, 27 C. Ferreira-Filho.

