

Original

Received December 31, 2021
Accepted for Publication June 6, 2022
©2022 Soc. Mater. Eng. Resour. Japan

Platinum-group Element Mineralization in the Merensky Reef of the Limpopo Mine, Eastern Limb of the Bushveld Complex, South Africa

Maki BIRUKAWA*, Yasushi WATANABE*, Takuya ECHIGO* and Carmela TUPAZ*

* Department of Earth Resource Science, Graduate School of International Resource Sciences,
Akita University, Akita 010-8502, Japan
E-mail: makibirukawa@gmail.com

In the present study, we discuss the platinum-group element (PGE) mineralization process in the Merensky Reef of the Limpopo mine, Eastern Limb of the Bushveld Complex, South Africa. The lithologies of an investigated drill core are norite and anorthosite with minor pyroxenite and chromitite. The Merensky Reef is hosted in pyroxenite with two chromitite layers and contains hydrothermal chlorite veinlets. Most of the platinum group minerals (PGMs) are found in interstitial sulfides and in euhedral orthopyroxene such as cooperite ($[\text{Pt}, \text{Pd}, \text{Ni}]_2\text{S}$), Pd-Au-Ag alloy and moncheite ($\text{Pt}[\text{Te}, \text{Bi}]_2$). Some PGMs such as kotulskite ($\text{Pd}[\text{TeBi}]$) and michenerite (PdBiTe) and hessite (Ag_2Te) are found in sulfide veinlets with alteration minerals. These results indicate that there are two stages of mineralization: magmatic PGE mineralization and later hydrothermal PGE mineralization.

Keywords : Platinum group elements, South Africa, Bushveld Complex, Merensky Reef