
A short overview of the use of PGEs (Platinum Group Elements) in modern industrial applications

Zoran Pandilov

Ss.Cyril and Methodius University in Skopje, Faculty of Mechanical Engineering, Karpos II b.b, P.O.Box 464,
Republic of Macedonia

e-mail: zoran.pandilov@mf.edu.mk

The platinum-group elements (PGEs) have similar physical and chemical properties and occur together in nature [1]. The properties of PGEs, such as high melting points, corrosion resistance, and catalytic qualities, make them indispensable to many industrial applications [2,3,4]. PGE are strategic and critical materials for many nations because they are essential for important industrial applications but are mined in a limited number of places and have no adequate substitutes [5,6].

This paper gives a short overview of the use of all PGEs (Platinum Group Elements) in modern industrial applications.

References

- [1] C.R.M. Rao, G.S. Reddi, Platinum group metals (PGM): occurrence, use and recent trends in their determination, *TrAC Trends in Analytical Chemistry*, Volume 19, Issue 9, September 2000, pp. 565-586.
- [2] M.L. Zientek, P.J. Loferski, Platinum-group elements—So many excellent properties, *U.S. Geological Survey Fact Sheet* (2014): 2014–3064, 2p, <https://dx.doi.org/10.3133/fs20143064>. ISSN 2327-6932 (online).
- [3] K. Hoppstock, B. Sures. Platinum Group Metals, *Chapter 20 in the book Elements and Their Compounds in the Environment: Occurrence, Analysis and Biological Relevance, Second Edition, 2008 WILEY VCH Verlag GmbH & Co. KGaA*, Print ISBN:9783527304592, Online ISBN:9783527619634, DOI:10.1002/9783527619634.
- [4] J. M. Brenan, The Platinum-Group Elements: “Admirably Adapted” for Science and Industry, *Elements* (2008) 4 (4): 227-232, <https://doi.org/10.2113/GSELEMENTS.4.4.227>.
- [5] C.R.K. Rao, D.C. Trivedi, Chemical and electrochemical depositions of platinum group metals and their applications, *Coordination Chemistry Reviews*, Volume 249, Issues 5–6, March 2005, pp. 613-631, <https://doi.org/10.1016/j.ccr.2004.08.015>.
- [6] A. Chen, P. Holt-Hindle, Platinum-Based Nanostructured Materials: Synthesis, Properties, and Applications, *Chem. Rev.*, 2010, 110 (6), pp. 3767–3804, DOI: 10.1021/cr9003902