## Contents

### Part I  Sources of PGE Emissions

**Sources of Platinum Group Elements in the Environment** ........................................... 3  
Sebastien Rauch and Bernhard Peucker-Ehrenbrink

**Impact of Platinum Group Element Emissions from Mining and Production Activities** ........................................... 19  
Sebastien Rauch and Olalekan S. Fatoki

### Part II  Analytical Methods for the Determination of PGE in Biological and Environmental Matrices

**Appraisal of Biosorption for Recovery, Separation and Determination of Platinum, Palladium and Rhodium in Environmental Samples** ........................................... 33  
Beata Godlewska-Żyłkiewicz and Julita Malejko

**On the Underestimated Factors Influencing the Accuracy of Determination of Pt and Pd by Electrothermal Atomic Absorption Spectrometry in Road Dust Samples** ........................................... 53  
Barbara Leśniewska, Sylwia Sawicka and Beata Godlewska-Żyłkiewicz

**Application of Solid Sorbents for Enrichment and Separation of Platinum Metal Ions** ........................................... 67  
Krystyna Pyrzynska

**Voltammetric Analysis of Platinum in Environmental Matrices** ........................................... 79  
Santino Orecchio and Diana Amorello
Speciation Analysis of Chloroplatinates ........................................ 97
Marianna Vitkova, Dinh Binh Chu, Gunda Koellensperger
and Stephan Hann

Analysis of Platinum Group Elements in Environmental Samples:
A Review ......................................................... 109
Roland Schindl and Kerstin Leopold

Part III Occurrence, Chemical Behavior and Fate
of PGE in the Environment

Brazilian PGE Research Data Survey on Urban
and Roadside Soils ..................................... 131
Ana Maria G. Figueiredo and Andreza P. Ribeiro

Platinum, Palladium and Rhodium in a Bavarian Roadside Soil ...... 145
Edzard Hangen and Thomas Dörr

Increase of Platinum Group Element Concentrations in Soils
and Airborne Dust During the Period of Vehicular Exhaust
Catalysts Introduction ..................................... 153
Hubertus Wichmann and Muefit Bahadir

Platinum-Group Elements in Urban Fluvial Bed
Sediments—Hawaii ........................................... 163
Ross A. Sutherland, Graham D. Pearson, Chris J. Ottley
and Alan D. Ziegler

Long-Term Monitoring of Palladium and Platinum Contents
in Road Dust of the City of Munich, Germany ......................... 187
Holger Sievers and Michael Schuster

Characterization of PGEs and Other Elements in Road Dusts
and Airborne Particles in Houston, Texas .......................... 199
Shankararaman Chellam and Ayşe Bozlaker

Accumulation and Distribution of Pt and Pd
in Roadside Dust, Soil and Vegetation in Bulgaria ................. 243
Valentina Lyubomirova and Rumyana Djingova
Increase of the Environmental Pt Concentration in the Metropolitan Area of Mexico City Associated to the Use of Automobile Catalytic Converters

Ofelia Morton-Bermea, Elizabeth Hernández-Álvarez, Sara Ordóñez-Godínez, Laura E. Beramendi-Orosco, Josué Vega-Rodríguez and Omar Amador-Muñoz

Solubility of Emitted Platinum Group Elements (Pt, Pd and Rh) in Airborne Particulate Matter (PM$_{10}$) in the Presence of Organic Complexing Agents

Beatrice Bruder, Clare L.S. Wiseman and Fathi Zereini

The Influence of Anionic Species (Cl$^-$, NO$_3^-$, SO$_4^{2-}$) on the Transformation and Solubility of Platinum in Platinum/Aluminum Oxide Model Substance

Fathi Zereini, Ilka Müller and Clare L.S. Wiseman

Solid State Platinum Speciation from X-ray Absorption Spectroscopic Studies of Fresh and Road Aged Three Way and Diesel Vehicle Emission Control Catalysts

Timothy I. Hyde and Gopinathan Sankar

Part IV  Environmental Bioavailability and Biomonitoring of PGE

Bioavailability of Platinum Group Elements to Plants—A Review

Nadine Feichtmeier and Kerstin Leopold

Monitoring of Platinum Group Element Deposition by Bryophytes

H.G. Zechmeister, Stephan Hann and Gunda Koellensperger

Field Studies on PGE in Aquatic Ecosystems

Nadine Ruchter, Sonja Zimmermann and Bernd Sures

Laboratory Studies on the Uptake and Bioaccumulation of PGE by Aquatic Plants and Animals

Sonja Zimmermann, Bernd Sures and Nadine Ruchter

Biological Effects of PGE on Aquatic Organisms

Bernd Sures, Nadine Ruchter and Sonja Zimmermann
Mechanisms of Uptake and Interaction of Platinum Based Drugs in Eukaryotic Cells ........................................ 401 Lukas Nejdl, Jiri Kudr, Iva Blazkova, Dagmar Chudobova, Sylvie Skalickova, Branislav Ruttkay-Nedecky, Vojtech Adam and Rene Kizek

Part V Human Health Exposures to PGE and Possible Risks

Biomonitoring of Platinum Group Elements (PGEs) in Occupational Medicine ........................................ 419 Iavicoli Ivo and Leso Veruscka

Platinum Metals in Airborne Particulate Matter and Their Bioaccessibility ........................................ 447 Clare L.S. Wiseman

Occupational Health Aspects of Platinum ....................... 463 Rudolf Schierl and Uta Ochmann

Index ............................................................... 477
Platinum Metals in the Environment
Zereini, F.; Wiseman, C.L.S. (Eds.)
2015, XXII, 492 p. 94 illus., 33 illus. in color., Hardcover
ISBN: 978-3-662-44558-7