

Concentrations of Platinum Group Elements (Pt, Pd, Rh) in Airborne Particulate Matter (PM_{2.5} and PM_{10-2.5}) Collected at Selected Canadian Urban Sites: a Case Study

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Abstract. Increasing environmental concentrations of platinum group elements (PGEs), in particular platinum (Pt), palladium (Pd) and rhodium (Rh), from catalytic converters has been reported worldwide. Initially it was believed that the emitted PGEs remain in the roadside environment, but recent studies have shown that fine PGE-containing particles can be transported and distributed at regional and long-range levels. Therefore, the monitoring of PGEs in airborne particulate matter (PM) is important for the estimation of potential risks to human health and to the ecosystem. The aim of this study is to present the first results from an analysis on the concentration and distribution of Pt, Pd and Rh in PM collected on Teflon filters at two selected urban sites (Toronto, Ontario; Edmonton, Alberta) collected within the Canadian National Air Pollution Surveillance (NAPS) network. In this work, a quadrupole inductively coupled plasma mass spectrometry (ICP-MS), combined with microwave assisted acid digestion using *aqua regia* was used. A cation exchange separation was used to alleviate the matrix-induced spectral and nonspectral interferences prior to ICP-MS analysis. To obtain sufficient material needed for PGEs analysis, fine PM (particles with aerodynamic diameter less than 2.5 mm; PM_{2.5}) and coarse PM (with aerodynamic diameter between 2.5 and 10 mm; PM_{10-2.5}) samples were combined into composite samples on a seasonal basis. The obtained results will be discussed and compared with literature data.

Key words: Platinum group elements, urban particulate matter, ICP-MS