

Street dust geochemistry at São Paulo University *campus*, Brazil

BOUROTTE C.^{1*}, OLIVEIRA J.B.¹

¹IGc-USP, rua do lago 562, CEP 05508-080 São Paulo-SP, Brazil, (*correspondence: chrisbourotte@usp.br ; jade.oliveira@usp.br)

Urban geochemistry is on concern around the world. The aim of this study is to discuss the concentration distribution, composition and possible sources of metals in street dust sampled in the *campus* of the University of São Paulo located at the western region of the São Paulo city, one of the largest cities of the world and South America. The *campus* is a green-park (7.4 km²) surrounded by avenues with intense vehicle traffic and inside a commercial and residential area of the city including some manufacturing activities.

Street dust sampling was performed during winter (dry season), in 1m² area that comprised gutter area and part of asphaltic pavement of the road. The samples were air-dried at room temperature and passed through a 2mm mesh nylon sieve to remove stones, grass, leaves or any other material (cigarette butt, plastic, etc.). All samples were homogenized, quartered and submitted to particle size, X-Ray Diffraction and SEM analyses. Trace metals were quantified in bulk and fine fractions by ICP-MS after acid digestion.

In bulk samples, the sand fraction was predominant and primary minerals such as quartz, feldspar and micas but iron oxides, carbonates and clay minerals have been also identified. Metal concentration showed a great variation in the sampling area and were higher for Cu, Mo, Ba, Pb, Hg, Cd, Ni and Zn, sometimes exceeding the Sao Paulo State environmental reference values. Pt, Pd, La, Ce were also quantified. Metal concentrations were higher in the fine fraction than in the bulk one. Some trace metals may be associated with tire wears (Al, Si, Ca, Zn) and brake abrasion dusts (Fe, Cu, Sb, Ti, Ba, Cr, Ni), street painting (Cr, Pb), surface automotive catalysts deterioration for Pt and Pd. SEM analyses showed diferent kind of particles from natural or anthropogenic sources such as primary minerals, zircon, barite, monazite, metallic spheres, agglomerates, metallic fragments.

Considering the results obtained in this study, there is a clear contribution of vehicular sources but also topsoil contribution. Since trace metals may also be transferred to atmosphere, soil and hydrosphere, further studies are required. In order to better understand the complex urban environment of the São Paulo city, further studies are being extended to other areas and metal isotopes will be used to track transfer processes.