Title: Size-segregated chemical composition of aerosol emissions in an urban road tunnel in Portugal

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Abstract: An atmospheric aerosol study was performed in 2008 inside an urban road tunnel, in Lisbon, Portugal. Using a high volume impactor, the aerosol was collected into four size fractions (PM0.5, PM0.5-1, PM1-2.5 and PM2.5-10) and analysed for particle mass (PM), organic and elemental carbon (OC and EC), polycyclic aromatic hydrocarbons (PAH), soluble inorganic ions and elemental composition. Three main groups of compounds were discriminated in the tunnel aerosol: carbonaceous, soil component and vehicle mechanical wear. Measurements indicate that Cu can be a good tracer for wear emissions of road traffic. Cu levels correlate strongly with Fe, Mn, Sn and Cr, showing a highly linear constant ratio in all size ranges, suggesting a unique origin through sizes. Ratios of Cu with other elements can be used to source apportion the trace elements present in urban atmospheres, mainly on what concerns coarse aerosol particles. (C) 2013 Elsevier Ltd. All rights reserved.

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