Estimation of the Contributions of Brake Dust, Tire Wear, and Resuspension to Nonexhaust Traffic Particles Derived from Atmospheric Measurements

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Abstract: Size-fractionated samples of airborne particulate matter have been collected in a number of campaigns at Marylebone Road, London and simultaneously at background sites either in Regents Park or at North Kensington. Analysis of these samples has enabled size distributions of total mass and of a number of elements to be determined, and roadside increments attributable to nonexhaust emissions arising from traffic activity have been calculated. Taking a novel approach, the combined use of size distribution information and tracer elements has allowed the separate estimation of the contributions of brake dust, tire dust, and resuspension to particle mass in the range 0.9-11.5 mu m aerodynamic diameter and mean contributions (+/- s.e.) at the Marylebone Road sampling site are estimated as resuspended dust 38.1 +/- 9.7%, brake dust 55.3 +/- 7.0%, and tire dust 10.7 +/- 2.3%, (accounting for a total of 104.1% of coarse particle mass in the traffic increment above background).

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