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Elemental and organic carbon and water-soluble ions determined in atmospheric particles collected at industrial and vehicular sites.

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Atmospheric particulate matter presents an important contribution in the regional and global air quality and in the human health. Metropolitan area of São Paulo (MASP) has a lot of number of inhabitants, vehicles and industries. Total suspended particles (TSP) were collected during the winter 2016 with a high volume sampler simultaneously at two site: the first one, 500 meters far from an industrial complex located at MASP; the second one, 8 kilometers from the first site, and it was close to an important avenue in MASP. The particulate matter concentration ranged from 17 to 53 μg m-3 for industrial site and between 28 and 99 μg m-3 for the second site, where there is a large contribution of vehicles, buses and trucks (vehicular site). The organic carbon (OC) and elemental carbon (EC) were determined by thermo-optical analyses developed at the University of Aveiro (Castro et al. 1999). OC average concentration were 6 μg m-3 and 9 μg m-3 for industrial and vehicular sites respectively, and EC mean concentration was over 3 μg m-3 for the both sites. OC/EC mean ratios were 2 for industrial site and 4 for vehicular site, indicated that the latter site received more contribution of secondary aerosols. Between the ions determined in this study by ion chromatography, Na+ (102 μg m-3) and Ca2+ (102 μg m-3) presented a significant contribution between the cations for the samples collected at industrial complex as well as SO42- (378 μg m-3) and NO_3- (223 μg m-3) for the anions. Sodium and calcium are associated with soil resuspension and the higher concentration of sulfate and nitrate may indicate a large influence of vehicle emission (Pereira et al. 2017). In the urban site, calcium (130 μg m-3) and ammonium (84 μg m-3) were the most abundant cations and sulfate (428 μg m-3) and nitrate (237 μg m-3), the anions. The industrial site was affected predominantly by primary sources, while the vehicular site received the influence of the both primary and secondary sources.

References:

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