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ATMOSPHERIC PARTICULATE MATTER ON MEDIUM CITIES AND THEIR IMPORTANCE FOR ATMOSPHERIC CHEMISTRY

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ABSTRACT

The number of urban areas is increasing around the world and special attention should be given to medium cities. Although such cities are not populous as megacities, their size and economic participation are increasing. In Brazil, for example the medium cities were those presented the highest growing from 2000 to 2010, above 3% per year. Therefore, they have an important role for atmospheric chemistry. To address this issue, the atmospheric particulate matters (PM) from two medium cities were evaluated in this work. Coarse and fine PM were collected in 2013 and 2014 in Summer and Winter in Maringa and Londrina cities, and majority soluble ions and black carbon were analyzed. The concentrations of PM were higher in Winter than Summer for both cities, due to climate conditions at this station. The ration of fine/coarse PM was of 0.3-0.4 for both cities and stations. A significant negative correlation was found between PM and relative humidity and positive for PM with temperature in winter. Mass concentrations of ions chloride, nitrate and sulphate presented highest values on wintertime as well the black carbon. The ration of nitrate-sulphate varied of 1.6 to 2.4 indicating a large influence of human activities in these places, mainly by biomass burning and fossil fuel burning. The fraction of black carbon on PM10 varied of 15% to 41% and has positive correlation with temperature and negative with wind speed. The significant presence of contaminants in PM indicates alterations on nitrogen cycles, climate and health promoted also by medium cities.