

## Distribution and Segregation of Aerosols in Ambient Air

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**Abstract :** Aerosols are complex mixture of particulate matters (PM) inclusive of carbons, silica, elements, various salts, etc. Aerosols get deep into the human lungs and cause a broad range of health effects, in particular, respiratory and cardiovascular illnesses. They are one of the major culprits for the climate change. They are emitted by the high thermal processes i.e. vehicles, steel, sponge, cement, thermal power plants, etc. Raipur (22°33'N to 21°14'N and 82°6'E) to 81°38'E) is a growing industrial city in central India with population of two million. In this work, the distribution of inorganics (i.e. Cl<sup>-</sup>, NO<sup>3-</sup>, SO<sup>4</sup><sup>2-</sup>, NH<sup>4</sup><sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>, Ca<sup>2+</sup>, Al, Cr, Mn, Fe, Ni, Cu, Zn, and Pb) associated to the PM in the ambient air is described. The PM<sub>10</sub> in ambient air of Raipur city was collected for duration of one year (December 2014 - December 2015). The PM<sub>10</sub> was segregated into nine modes i.e. PM<sub>10.0-9.0</sub>, PM<sub>9.0-5.8</sub>, PM<sub>5.8-4.7</sub>, PM<sub>4.7-3.3</sub>, PM<sub>3.3-2.1</sub>, PM<sub>2.1-1.1</sub>, PM<sub>1.1-0.7</sub>, PM<sub>0.7-0.4</sub> and PM<sub>0.4</sub> to know their emission sources and health hazards. The analysis of ions and metals was carried out by techniques i.e. ion chromatography and TXRF. The PM<sub>10</sub> concentration (n=48) was ranged from 100-450 µg/m<sup>3</sup> with mean value of 73.57±20.82 µg/m<sup>3</sup>. The highest concentration of PM<sub>4.7-3.3</sub>, PM<sub>2.1-1.1</sub>, PM<sub>1.1-0.7</sub> was observed in the commercial, residential and industrial area, respectively. The effect of meteorology i.e. temperature, humidity, wind speed and wind direction in the PM<sub>10</sub> and associated elemental concentration in the air is discussed.

**Keywords :** ambient aerosol, ions, metals, segregation

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