

# Source apportionment studies in six Indian cities—drawing broad inferences for urban PM<sub>10</sub> reductions

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## Abstract

PM<sub>10</sub> is a critical air pollutant in urban areas of India. Out of 176 cities, 140 exceeded annual PM<sub>10</sub> standard of 60 µg m<sup>-3</sup> in 2010. A detailed PM<sub>10</sub> source apportionment study was conducted in six Indian cities during 2007–2010, providing insight to urban PM<sub>10</sub> issues. Data on emission inventory along with carbon, secondary inorganic aerosol (SIA) and crustal components of ambient PM<sub>10</sub> were analyzed to get broad actions for urban PM<sub>10</sub> reduction. Road dust and vehicles emerged as two major sources accounting for ~30 to 70 % and ~15 to 20 % of PM<sub>10</sub> emissions, respectively. Maximum concentration of EC, SIA, and crustal components varied between 10.3–38.0, 15.5–30.2, and 17.5–40.6 µg m<sup>-3</sup>, respectively. Kerbside locations showed higher EC levels. Background SO<sub>4</sub><sup>2-</sup> and NO<sub>3</sub><sup>-</sup> levels were ~70–80 % of city average. Controlling dust from road segments with high traffic volume, emissions from heavy duty vehicles, and efficient public transport emerged as key actions. Reducing SO<sub>2</sub> and NO<sub>x</sub> emissions from industries in nonattainment cities will reduce SIA. The six-city project represents a large range of activity, geophysical, and meteorological profiles, and as such would represent source mix of many Indian cities and towns. It would, therefore, be reasonable to apply broad inferences from the study to other Indian cities and towns.

## Keywords

Urban PM<sub>10</sub> reduction   Chemical speciation   Source apportionment   India

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## Notes

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