



Identification and Analysis of PM_{2.5} WSI_s and Trace Gases during Winter Season at Industrial Zone of Tatanagar

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ABSTRACT

This study has been conducted from Dec 2014 to March 2015 and data of fine particle and trace gases (SO₂ and NO₂) were collected. The high volume sampler was used for collection of PM_{2.5} and trace gases (SO₂ & NO₂) were collected with impinger equipped with PM sampler. The average winter season PM_{2.5} mass concentrations from Industrial (A-1), Traffic (A-2), Academic (A-3) and Rural (A-4) sampling sites of Adityapur industrial zone, Tata nagar are 178±68 µg/m³, 102 ± 56 µg/m³, 174.5 ± 84 µg/m³ and 88.25±37 µg/m³ respectively. Water soluble ionic species ions (Na⁺, NH₄⁺, K⁺, Mg²⁺, Cl⁻, NO₃⁻ and SO₄²⁻) were analyzed with ion chromatography. The three most abundant ions were SO₄²⁻, NO₃⁻, and NH₄⁺ with average concentrations of 6.41±1.5, 2.40±0.30 and 2.96±0.62 µg/m³, respectively. The trace gaseous present in study area having average concentrations of SO₂ and NO₂ were 38.25±4.55 and 52.18±4.85 µg/m³, respectively. The total average concentration of SO₂ and NO₂ were much lower than the standards guideline values of the WHO. The evolution patterns clearly show the winter season of fine PM_{2.5} with impaction low temperature. An air-mass pathway traced using HYSPLIT model over the study area illustrates the direction and dispersion of pollutants.

Keywords: PM_{2.5} Trace gases, Water soluble ions, WHO. HYSPLIT model.
