

Case Study

Measurement of Ambient NH₃, NO and NO₂ at an Urban Area of Kolkata, India

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Abstract

Mixing ratios of ambient NH₃, NO and NO₂ were measured in campaign mode at Kolkata a megacity of IndoGangetic plain of India to study the diurnal variation and mixing ratios of NH₃, NO and NO₂ during 24–27 February 2012. The present study has been carried out on campaign based measurement of mixing ratios of NH₃, NO and NO₂ for short period of time at Kolkata represent the indicative values over the region. The average mixing ratios of ambient NH₃, NO and NO₂ were recorded as 43.4 ± 7.0 ppb, 46.0 ± 8.7 ppb and 31.9 ± 5.5 ppb at Kolkata. In the present case, significant diurnal variation of NH₃, NO and NO₂ were recorded at Kolkata during study. Mixing ratio of ambient NH₃ reaches its maxima (78.9 ppb) at night and minimum during daytime. Result reveals that the ambient NH₃ mixing ratio is positively correlated with ambient NO ($r^2 = 0.395$) and NO₂ ($r^2 = 0.404$) mixing ratio and significant negatively correlated with ambient temperature ($r^2 = -0.669$). Surface wind direction and wind speed analysis indicates that the local activities (livestock, drainage, agriculture, vehicles etc.) may be the possible sources of ambient NH₃ at the observational site of Kolkata.

Keywords

Ambient NH₃; NO; NO₂; Chemiluminescence method