AOGS 2005

Measurement of SO_2, NO_2, HNO_3 and NH_3 and related particulate matter at a sub-urban site in a sub-tropical region

RANJIT KUMAR[1], S.S. SRIVASTAVA[1] and K. MAHARAJ KUMARI[1]
[1]*Department of Chemistry, Faculty of Science, Dayalbagh Educational Institute*

Measurements of atmospheric concentration of gaseous SO_2, NO_2, HNO_3 and NH_3 and their related particulate matter SO_4^{2-}, NO_3^- and NH_4^+ has been done at Dayalbagh a sub urban site in tropical India. Atmospheric annual mean concentrations are 3.5 ± 1.4, 5.4 ± 1.5, 1.5 ± 0.8 and 10.5 ± 2.4 µg m^{-3}, respectively and 2.7, 1.2 and 3.6 µg m^{-3}. SO_2 and NO_2 show highest concentration in winter; HNO_3 shows highest concentration in summer; NH_3 shows highest concentration in monsoon while maximum concentration has been observed in summer for particulate SO_4^{2-} and NO_3^- and in monsoon for NH_4^+. Summer to winter ratio of HNO_3 and particulate NO_3^- are 2.1 and 1.7, respectively, showing seasonal variation is more pronounced in case of HNO_3 than particulate NO_3^-. The ratio of gaseous NH_3 to particulate NH_4^+ (NH_3/NH_4^+) is more than 1 probably due to basic nature of aerosol. Examination of equilibrium between gaseous NH_3 and HNO_3 and particulate NH_4NO_3 shows observed equilibrium constant is lower than theoretical equilibrium constant in summer and vice versa in winter.

Key word: Gas, particulate, concentration, seasonal variation, equilibrium constant