Chemical Characterization of PM2.5 and PM10 at a Location (Varanasi) in the Indo Gangatic Plain of India

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Several studies have investigated the close relationship between physico-chemical characteristics of ambient particulate matter (PM) and climate change as well as adverse health effects, thus highlighting the need to limit their anthropogenic sources. In order to investigate the chemical characteristics of atmospheric aerosols at a location in the Indo - Gangetic plane of India, PM2.5 and PM10 were collected using particulate sampler at Varanasi (25^0 19'N, 83^0 E, 80.7m above MSL). The concentrations of elements in the samples were detected by X-Ray Florescence Spectroscopy (XRF) and Atomic Absorption Spectroscopy (AAS). The results showed that Si, S, Al, K, Na, Mg, Cl, Ca were the major components in $PM_{2.5}$ and PM_{10} having a share of more than 85%. However, Si and S were the dominating component in PM10 and PM2.5, respectively. Several anthropogenic heavy metals (Ni, Cu, Cr, Fe, Ag, Zn, Tl, Mn) were also detected in the samples. Anions present in the samples were calculated using Ion Chromatograph (IC) after extraction. Ions like NO_3^- and SO_4^{2-} were found to be the dominating components present in the samples.

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