CHEMICAL COMPOSITION AND SOURCES APPORTIONMENT OF RAIN WATER IN AN URBAN AND A RURAL AREA OF BANGLADESH

Mohammad Ullah

Cardiff International School Dhaka, Bangladesh

34 samples of rain water were collected from Dhaka city and Bhola island of Bangladesh during monsoon season (June to September) of 2015. Different physical properties of rain water, e.g. pH, electrical conductivity etc. was measured. Concentrations of different cations and trace metals (Na^+, K^+, Ca^{2+} and Mg^{2+}, Zn, Fe and Mn) and anions (Cl^-, SO_4^{2-}, NO_3^- HCO_3^-) in rain water were determined by using atomic absorption spectroscopy (AAS) and ion chromatography (IC), respectively. Source characterization of the chemical species in rain water was conducted with a combination of correlation analysis, enrichment factor analysis, % source contribution calculation and air mass trajectory analysis. The average concentrations of $SO_4$2- in rain water from Dhaka and Bhola were 12.53 µeq L^{-1} and 8.48 µeqL^{-1} and the concentrations of NO_3- were found to be 40.64 µeq L^{-1} and 33.93 µeq L-1, respectively. The average concentrations of Na^+ and Cl^- were 20.43 µeq L^{-1} and 18.31 µeq L^{-1} for Dhaka and 25.17 µeq L^{-1} and 18.90 µeqL-1 for Bhola, respectively. The total dissolved solids in rainwater of Dhaka and Bhola were 8.85 mg L^{-1} and 6.78 mg L^{-1}, respectively. The concentration of Zn was higher in Dhaka whereas the concentration of Fe was higher in Bhola. Neutralization factor analysis showed that Ca and Mg were the major neutralization constituents of the rain water in both areas. High enrichment factors of SO_4^{2-} and NO_3^- were a good indication of anthropogenic sources. Correlation factor analysis showed that the compounds that bore the components were mainly $ZnSO_4$, NaCl and KCl.

muduchem1112@gmail.com