

**DETERMINATION OF TRACE METAL LEVELS IN BULK DEPOSITION AT
UNIVERSITY OF PERADENIYA**

L.S. Madhushani¹, S.P. Abeyesundara² and N. Priyantha^{1*}

¹*Department of Chemistry, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka*

²*Department of Computer Science and Statistics, Faculty of Science, University of Peradeniya,
Peradeniya, Sri Lanka*

**namal.priyantha@yahoo.com*

The composition of atmospheric precipitation is an important criterion considered as a measure of ambient air pollution. It is usually determined with respect to wet precipitation and dry precipitation, or as bulk deposition in combined form. Although rainwater quality should be continuously monitored in order to predict the extent of air pollution, such investigation receives no attention in Sri Lanka. In order to fill this void, this study was aimed to determine the composition of bulk deposition collected weekly from February to December, 2019 at the University of Peradeniya premises. Parameters, namely rainfall, pH, conductivity, salinity, total dissolved solids (TDS), hardness and trace metals (Al, Cr, Cu, Fe, Mn, Pb and Zn) were quantitatively determined, employing standard analytical methods. The pH measurements indicated that no acid rains have occurred during the sampling period, and the trace metal contents showed the sequence $Zn > Fe > Al > Mn > Cu > Pb$ indicating that Zn, Fe and Al are the dominant metal elements in bulk deposition in Peradeniya area. The sources of Zn pollution in this area could be Zn coated roof materials, lubricants, brass manufacture and vehicular activities. Further, the hardness values showed an average of 18.97 mg L⁻¹ CaCO₃ equivalent, indicating the contribution of burning limestone and dolomite, which is prevalent in the area. Bulk precipitation data analyzed using Pearson correlation showed that the high positive significant correlations were apparent between conductivity and salinity, conductivity and TDS, and salinity and TDS, among all water quality parameters. It is also found that, among the trace metals, the highest positive significant correlation was between Fe and Mn, indicating that these two metals would have originated from the same sources, which could be from soil dust particles. Continuation of rain water analysis for a longer period would be necessary to formulate an atmospheric model for prediction of consequences of air pollution.

Keywords: Air pollutants, Bulk deposition, Pearson correlation, Trace metals