Trace Element Geochemistry of Groundwater, Patancheru Industrial Area, Hyderabad, Andhra Pradesh, India

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Patancheru Industrial Area located about 40 km from Hyderabad is one of the most contaminated regions identified by central regulatory body in India. About 250 small and large-scale industries manufacture pharmaceuticals, paints, pesticides and chemicals apart from steel and metallic products in this region. Several small streams drain through the area to join the main Nakkavagu stream, which merges, into Manjira River, after percolating into the sub-surface. A preliminary study was undertaken in an area of about 65 km2 in and around Patancheru to determine the spatial distribution of trace elements in groundwater and to assess the extent of pollution, and its impact on human health. Several groundwater samples were collected from bore wells for the determination of minor and trace elements (Li, Be, B, Si, V, Cr, Mn, Fe, Co, Cu, Zn, As, Se, Rb, Sr, Mo, Ag, Cd, Sb, Ba and Pb) by ICP-MS using the standard reference material NIST1640 (Standard for trace elements in natural water) for calibration. Ma-jor cations (Ca, Mg, Na, K) were also estimated to characterize the groundwater. Fe (381 to 1848.3 μ g/L) was found to exceed the drinking water permissible limit by about six times. As (1.9 to 19.3 μ g/L), Se (0 to 40.2 μ g/L), Cr (32.7 to 176.9 μ g/L), Cu (1.9 to 148.8 μ g/L) and Mn (1.5 to 776.7 μ g/L) show high variability in some places indicating heterogenetic characteristic of trace element transport in groundwater. Contour maps for several trace elements were prepared to identify the source and transport of the contaminant.

Keywords: Trace elements, geochemistry, Patancheru Industrial Area, India