Physico-chemical characteristics and geochemical composition of soil from the former Air Terjun Mine, Kota Tinggi, Johor

Abstract

A study on physico-chemical characteristics and geochemical composition of soil from the former Air Terjun Mine, Kota Tinggi Johor was carried out. The mine was known to produce tin and iron until the end of 2001 when their operation ceased. A number of 15 topsoil (0 - 20 cm) samples were collected east way direction using 'Dutch Auger'. Sampling area represented five different kinds of land use that were forest area (S1), open area (S2), pond edge (S3), sand tailing (S4) and river sediment (S5). Three soil samples were collected to represent every type of land use. The soil samples were determined for their physico-chemical characteristics and geochemical compositions. Major element compositions of soils were dominated by SiO2 followed by Fe 2O3 and Al2O3. TiO2 and MnO content were less than 4.11% whereas K2O and P2O 5 content were less than 1%. The range of concentration for heavy metal were 105-1066 g/g for Zr, 31-107 g/g for Pb, 149-723 ug/g for As, 23-319 ug/g for Zn, 15-586 ug/g for Cu, 5-15 g/g for Ni, 7-144 g/g for Co and 25-66 g/g for Cr. The organic matter content ranged from 1.63 to 2.41%. Bulk density of some of the soil sample was high which indicates the presence of high density mineral. pH of the soil samples in the study area ranged from 3.81 to 5.20, thus acidic. The cation exchange capacity mean ranged from 1.19 to 5.41 cmol(+)/kg, whereas the electrical conductivity value ranged from 2.19 to 2.38 mS/cm.