The matrix may substantially worsen the accuracy of the analytical results and the true detection limits, and affect line selection, chiefly because of spectral interferences. The most difficult samples from this point of view are soils and various types of sediments. Efficient and accurate background correction for these interferences normally requires a means of measurement of the background intensity adjacent to the analyte wavelengths.

An ICP-AES method is proposed for the determination of As, Cr, Pb, Cu, Mn and Zn in soils and sediments. The quantification of spectral interferences in the presence of Al, Ca, Mg, Fe, Ti, K, and Na as matrix constituents and the optimum line selection are made. The accuracy of analytical results is estimated by certified reference materials: IAEA/Soil 7 and lake sediment IAEA/SL.1.

Two digestion procedures are used: extraction of trace elements soluble in aqua regia in accordance with ISO 11466/1995 and total decomposition of the matrix in the presence of hydrofluoric acid. In both cases the silicon as matrix element is separated. Influence of the concentration of matrix constituents Al, Mg, Ca, Fe, Ti, K and Na on the true detection limits and on the slope of calibration curves (non-spectral matrix effects) are investigated. The experiments are performed with a radial viewing 40.68 MHz ICP.