SUMMARY

This master thesis is a part of project IGCP No. 594: “Assessment of Impact of Mining and Mineral Processing on the Environment and Human Health in Africa,” and its goal is to determine and compare mercury content in 91 soil samples from mining and smelting areas in northern Namibia and 68 soil samples from the Copperbelt province in Zambia. Highest mercury concentrations in soils (with maximum 4.39 mg Hg kg-1) were found near the Tsumeb copper smelter in Namibia, whereas Hg concentrations were significantly lower in the Zambian Copperbelt (up to 0.392 mg Hg kg^{-1}). Decreasing concentration of contamination corresponding to distance from the source of pollution has been confirmed at both localities. For an estimation of a possible source of contamination, 26 samples from smelting processes and waste were also taken. Highest concentrations of Hg were observed in Tsumeb again (219 mg Hg kg^{-1} in bag-house residue and 3,5 mg Hg kg-1 in processing wastes on tailing dams). Studies of mercury mobility in soil profile by correlation coefficients has shown Hg dependent on the content of sulfur and organic carbon, which indicates a dependence on the content of organic matter. Among metals and metalloids best correlations between Hg and Cu, As, Sb, Pb, and Zn were calculated. Because mercury is currently intensively studied in relation to an artisanal and small-scale gold mining, it is usually is not analyzed and interpreted by studying pollution caused by smelting of non-ferrous metals. For this reason our data was used for the construction of regression analysis models, which, based on concentrations of other contaminants, could predict mercury concentrations in soils for both areas.