

Abstract

This diploma thesis focuses on bulk chemical and mineralogical compositions of modern slags from Cu metallurgy at the Luanshya site in the Zambian Copperbelt. The aim of this thesis was to describe the formation of these slags, distribution of trace elements and their leachability. Slag samples were characterized using a combination of analytical methods (optical microscopy, scanning electron microscopy, X-ray diffraction analysis, quantitative microanalysis, electron microprobe analysis and leaching test designed to assess the environmental risk). Slags are mainly composed of silicates (clinopyroxene and fayalite) and silicate glass. Less common are melilite, leucite and monticellite. Grains of quartz were occasionally found in the slag matrix and correspond to a non-melted gangue. Copper is bound in sulfides or forms small inclusions trapped within in the silicate matrix. The crystallization process was probably relatively fast as revealed by skeletal crystals of olivine and the presence of glass. Copper concentrations in slags range from 1321-95 300 mg/ kg, Co concentrations in slags range from 247-5990 mg/kg. The EN 12457-2 leaching test demonstrated that harmful elements are not substantially released into the environment.