

## Summary

Metal contamination of soils is one of the most important environmental problems throughout the world. One of the possible remediation technique of contaminated soils is based on chemical stabilization using various amendments. Due to their structure and sorption properties ( $\text{pH}_{\text{ZPC}}$ , specific surface, CEC etc.), Fe, Mn and Al oxides are suitable for this remediation technique. The focus of this diploma thesis is to evaluate the stability and the effectivity of the new synthetic amorphous Mn oxide (AOM) in soil samples with contrasting physicochemical parameters, mainly pH: soil N (pH 4,2), soil H (pH 5,4), soil S (pH 7,3). In a 90-day laboratory pot experiment with incubation of AOM in these soils we found that stability of AOM is strictly pH-dependent. Higher dissolution was observed in the most acidic soil N (mass loss up to 18%), whereas in alkaline soil S the mass loss attained only 10%. The dissolution of AOM in acidic soils (N, H) was connected with a significant release of Mn into the soil pore water. For soils H and S the massive formation of secondary carbonate phases (rodochroite –  $\text{MnCO}_3$ , kutnahorite –  $(\text{Ca},\text{Mn})\text{CO}_3$ ) was detected on the AOM surfaces by X-ray diffraction analysis (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM). Granulometric measurements indicated that AOM have tendency to aggregate to larger particles ( $> 10 \mu\text{m}$ ) during incubation in soils. Our results indicate that AOM is more suitable as amendment for alkaline soils. Precipitation of secondary carbonates and aggregation to larger particles is probably leading to decrease of the sorption capability of AOM. Further *in-situ* experiments are therefore necessary to assess the efficiency of AOM amendment in real soil systems.