

SP IRON OXIDES IN SOILS DEVELOPED ON LIMESTONES

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Generally, in the case of polluted soils developed on non-magnetic background, magnetic susceptibility is usually strongly enhanced in the topsoil layer and rapidly decreases with a depth. Contrary to that, in unpolluted areas with strong natural magnetic background (mostly on basaltic bedrock), magnetic signal is increasing with a depth. In our study we will present and discuss our observations from relatively unpolluted area, where soils are developed on non-magnetic basement rocks (limestones). The study is focused on soils from Belogradchik area (NW Bulgaria) where soils shows high magnetic susceptibility ($15 \times 10^{-7} \text{ m}^3/\text{kg}$), practically constant along vertical profile and with high frequency-dependence (8-14% using Bartington MS2B).

The main aim is to identify and to characterize ultra-fine super-paramagnetic particles. We will present several indicators, suggesting significant presence of SP particles. Frequency-dependent magnetic susceptibility, measured using Bartington MS2B Meter was complemented by measurements using Agico instrument MF K1. Set of magnetic analysis of soil and rock samples were carried out using vibrating magnetometer ADE EV9 VSM, MPMS XL-5 Quantum Design and KLY-S4 Kappabridge with CS-3L furnace. Furthermore, non-magnetic analysis, such as Mössbauer spectroscopy, SEM + WDS observations and CBD extractions, were accomplished.

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