

## WEATHERING OF SMECTITE AT KOPERNICA DEPOSIT

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Kopernica bentonite deposit is situated in the south-western margin of the Kremnické vrchy Mountains in the Western Carpathians. Deposit origin was probably influenced by two main processes – diagenetic and autohydrothermal alteration of rhyolite products.

Mineral composition of Kopernica bentonite was studied by XRD, FTIR and chemical analyses. There is a variation of smectite content and presence of other minerals like quartz, feldspars, biotite, kaolinite and a cristobalite. Dominant mineral phase is Al-Mg montmorillonite.

Weathering profile developed on the top surface of Kopernica bentonite under Central European temperate conditions was studied and compared with similar profile studied by ŠUCHA *et al.* (2001) on the Jelšovský Potok deposit.

Weathering of montmorillonite at the Jelšovský Potok deposit resulted in the decrease of cation exchange capacity (CEC), total surface area (TSA) and in the thickness of the smectite crystals. The process was interpreted as montmorillonite partial dissolution and precipitation of amorphous SiO<sub>2</sub>. At the Kopernica deposit we could see very similar trend but the range of weathering processes was not so intensive (Table 1). Results from sample Kop 5 do not agree with the mentioned trend due to the increased amount of cristobalite.

### Reference

ŠUCHA, V., ŠRODOŇ, J., CLAUER, N., ELSASS, F., EBERL, D.D., KRAUS, I. & MADEJOVÁ, J. (2001): Clay Minerals, 36: 403–419.

**Table 1:** Depth of sampling from the soil surface, pH of water suspensions of the bulk samples, total organic carbon (TOC) contents of the bulk samples, total surface area (TSA), average thickness of the smectite crystals, and cation exchange capacity (CEC).

Sample	Depth (cm)	pH	TOC (%)	TSA (m <sup>2</sup> /g)	Thickness (nm)	CEC (mEq/100g)
Kop 1	0–20	5.63	10.955	-	7.02	44.41
Kop 2	80–100	4.43	0.25	719.33	8.81	90.64
Kop 3	120–160	4.81	0.175	944.8	9.16	89.18
Kop 4	200–220	4.82	0.125	1009.97	9.83	89.54
Kop 5	300–350	5.04	0.11	893.49	9.15	63.7