



## **The complex nature of hydrothermal smectites and mixed layer minerals from an andesite near Wurgwitz, Saxony, Germany**

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At Wurgwitz near Dresden, Saxony, Germany, a quarry was opened recently to retrieve material from the “Wilsdruff-Potschappel Porphyrite”. This Permo-Carboniferous, latitic-andesitic lava flow shows intensive alteration features in its upper sections. The material is dissected by a series of fissures (herzynic strike, 80-90 ° dip), which exhibit intensive green coloured, clayey fillings as well as disintegrated, grey to brown fissure flanks.

Several alteration types of different macroscopic habit could be deciphered. The material was sampled and investigated by XRD, DTA-TG-DTG, SEM, RFA, AAS and EDS techniques. In general, three types of dioctahedric smectites could be identified and characterised. 1) Montmorillonite with beidellitic character or sometimes typical beidellite, 2) smectite with nontronitic character, and 3) chromium-rich smectite, fulfilling preconditions for designating it volkonskoite. The latter was not described from Saxony, yet, and is an overall rare mineral (four findings worldwide). Further, a regular trioctahedral mixed layer mineral, corrensite, could be identified.

Several arguments suggest hydrothermal or metasomatic processes related to both, formation of the identified clay minerals and alteration of the andesite itself: 1) Pipes with iron-rich, gel-like coatings on several fissure fillings may be interpreted as remnants of circulated fluids. 2) Concentration of magnesium within bedrock is insufficient to allow smectite neof ormation at all. 3) High amounts of chromium and vanadium argue for allochthonous element supply. The source of chromium, leading to volkonskoite formation remains unclear, yet.