

## Geochemical characteristics of two phosphorite occurrences from the Transdanubian mountain range (NW Hungary)

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The carbonate-dominated Mesozoic sequence of the Transdanubian Central Range contains layered phosphorite in the Triassic (near Pécsely) and nodular phosphorite in Cretaceous (near Tata) strata. Both phosphorite occurrences may be important because of their trace element content. Uranium enrichment was proven in the Triassic phosphorite layers, in contrast, the chemical composition of the Cretaceous formation has not been studied yet.

The depositional age of the Triassic phosphorite is well constrained by marine biostratigraphy. The LA-ICP-MS U-Pb age  $237 \pm 11$  Ma coincides with the stratigraphic age – indicating negligible ion exchange during burial history. The main mineral is carbonate-fluorapatite, but calcite and rarely hematite also occur. According to EPMA analyses, the U enrichment in the phosphorite layer is most likely related to the carbonate-fluorapatite, as it contains 0.023-0.3 mass% U, while no other U-bearing minerals were observed. A total REE content of 0.031-0.889 mass% (La, Ce, Nb, Dy, Sm, Nd, Tb, Pr, Ta, Y, Gd, Eu) was also detected. Based on the elemental distribution mapping, both the U and REE occur homogeneously distributed in the crystals. The analyses revealed that the  $\text{UO}_2\text{-SO}_3$  and  $\text{P}_2\text{O}_5\text{-CaO}$  content correlate positively, while the  $\text{UO}_2\text{-P}_2\text{O}_5$ ,  $\text{P}_2\text{O}_5\text{-SO}_3$  and  $\text{SO}_3\text{-CaO}$  content correlate negatively. The results suggest that the phosphorite formed partly during sedimentary processes, syngenetic with the host limestone, though traces of a later fluid mobilization are also found.

In contrast, the Cretaceous nodular phosphorite occurs at the basis of the Aptian grey, Crinoidea-bearing limestone. The structure and texture of the Cretaceous phosphorite strongly differ from the Triassic phosphorite, indicating principal differences in genesis. We aim to describe the formation mechanism by geochemical composition of this occurrence, the aims of this research are to investigate this formation with modern tools and to compare it to the already well described Triassic phosphorite.