

A NEW TWIN LAW FOR THE ALUNITE GROUP MINERALS

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Plumbogummite, an alunite group mineral was recently described from Szűzvár mine, Pátka, Velence Mts., Hungary by ZAJZON & SZENTPÉTERI (2000).

SEM studies demonstrated that part of the plumbogummite crystals are characterized by systematic regular intergrowth, penetration twins (see Fig. 1). None of the twin laws published previously for the alunite group minerals produce twin crystals of that shape. The aim of this study was to describe the geometrical characteristics of the new twin law and to find the structural background of twinning.

The size of the crystals (maximum 0.02–0.03 mm) did not allow us to use the standard method (reflection goniometry) for the determination of the geometrical relationship between the crystals. We could use only the SEM pictures, where the measurement of the directions and angles, related to the trivial morphological features of the individual crystals, could not be made with an error smaller than a few degrees, even if we measured several crystals in different orientations. Based on these rough data, we started to reconstruct the twin through comparison of the observed crystals and the models created by a computer program (SHAPE). The models suggested a rotational twin (twin axis: $[21\bar{3}1]$, rotation: approximately 65°).

To confirm this, we searched for evidences in the crystal structure of alunite by using another computer program (ATOMS). The structure was plotted both perpendicular to and (by rotations) parallel with the suggested twin axis. It became obvious that there are two planes in the structure (both containing the $[21\bar{3}1]$ direction and the a_1 and a_3 Bravais axes, respectively) where the polyhedral ribbons were found to be identical. On the $[21\bar{3}1]$ view, an angle of 70° was measured between the planes.

Thus we suppose a twin law for the alunite structure, with a 70° rotation about $[21\bar{3}1]$. Further occurrence of alunite group crystals of that type of twinning will give a chance for further refinement of these data.

Reference

ZAJZON, N. & SZENTPÉTERI, K. (2000). *Acta Miner. Petr.* (Szeged), 41, Suppl.: 120

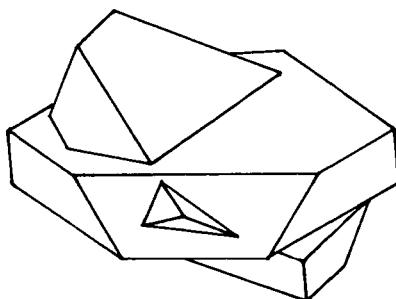


Fig. 1: Penetration twin of plumbogummite from Pátka, Hungary.