

**Investigation of polytype occurrence in lepidolite from lithium pegmatite by EBSD**

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In this paper we show that electron back-scattered diffraction (EBSD) is an effective technique for identifying polytypes of micas in a scanning electron microscope (SEM). Platy crystals mounted on a specimen holder are instantly analyzed and the polytypes are determined by comparing observed and calculated Kikuchi patterns. The EBSD identification has been applied to the investigation of polytype occurrence in lepidolite from Myouken-san lithium pegmatite. 1M, 2M1 and 2M2 polytypes were unambiguously distinguished. Some crystals contained polytypes of the two subfamilies stacked along the [001]\*direction. Combination of X-ray chemical analyses and EBSD in a SEM showed that the chemical compositions of 1M and 2M1 crystals were segmented, whereas those of 2M2 were in the span of those of both 1M and 2M1.