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# Polytype Diversity of the Hydrotalcite-Like Minerals II. Determination of the Polytypes of Experimentally Studied Varieties

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**Abstract:** Polytype diversity of hydrotalcite-like minerals is mainly a function of the nature of the interlayer anion. Among the varieties with  $\text{CO}_3^{2-}$  anions, only two- and three-layer polytypes having the same structure as manasseite and hydrotalcite have been confirmed. Stichtite and reevesite, which have been previously identified as six-layer polytypes, are in fact three-layer polytypes.

Among  $\text{SO}_4^{2-}$  varieties, one-layer and three-layer polytypes have been identified, but the one-layer types are only present in more hydrated minerals with larger interlayer spacings. The three-layer varieties are of three different polytypes, with both P- and O-types of interlayers. Both rhombohedral and hexagonal varieties exist. Interlayer type may change during hydration-dehydration or anion exchange. Thus, in contrast with the  $\text{CO}_3^{2-}$ -bearing minerals, a complete description of the polytype of the  $\text{SO}_4^{2-}$ -bearing minerals cannot be made by simply indicating the number of the brucite-like layers in the unit cell.

The two-layer unit cell seen in refined crystal structures of some minerals with  $\text{SO}_4^{2-}$  interlayers is not due to a doubled periodicity of alternation of brucite-like layers but to periodicity of interlayer anions, or layer cations.

**Key Words:** Hydrotalcite-like group • Polytype • X-ray diffraction criteria

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