

Twinning in pyromorphite: The first documented occurrence of twinning by merohedry in the apatite supergroup

STUART J. MILLS,^{1,2,*} GIOVANNI FERRARIS,³ ANTHONY R. KAMPF,² AND GEORGES FAVREAU⁴

¹Geosciences, Museum Victoria, GPO Box 666, Melbourne 3001, Australia

²Mineral Sciences Department, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007, U.S.A.

³Dipartimento di Scienze Mineralogiche e Petrologiche, Università degli Studi di Torino, Via Valperga Caluso 35, I-10125 Torino, Italy

⁴421 Avenue Jean Monnet, 13090 Aix-en-Provence, France

ABSTRACT

We describe the first documented case of $\{10\bar{1}0\}$ twinning by reflection (or by twofold rotation about $[100]$) or merohedry (class II) in a member of the apatite supergroup. Twinning about $[100]$ had previously been noted for the apatite supergroup but not confirmed. Pyromorphite crystals from Puech de Compolibat, Combret, Aveyron, France, were studied by single-crystal X-ray diffraction [$a = 10.0017(19)$, $c = 7.3413(16)$ Å, and $V = 636.0(2)$ Å³, in $P6_3/m$], where twinning was confirmed with the approximate twin fraction 62:38. Subsequent inspection of the morphology confirmed the nature of the twinning. The pyromorphite crystals are typically elongate and show the faces: $(2\bar{1}\bar{1}0)$, $(\bar{2}110)$, (0001) , $(000\bar{1})$, $(10\bar{1}0)$, $(\bar{1}010)$, $(10\bar{1}\bar{2})$, and $(\bar{1}01\bar{2})$.

Keywords: Twinning by merohedry class II, pyromorphite, Puech de Compolibat, apatite supergroup, crystal structure