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LETTER

Ordering of iron vacancies in monoclinic jarosites

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ABSTRACT

The results of in situ synchrotron X-ray powder diffraction experiments conducted during the synthesis of iron-deficient $\text{Na}^+/\text{H}_3\text{O}^+$ and $\text{K}^+/\text{H}_3\text{O}^+$ jarosites at temperatures in the range 80 to 120 °C are presented. They demonstrate that samples can be prepared in which the iron-site vacancies are ordered. The ordering is accompanied by a lowering of symmetry, from rhombohedral, space group $R\bar{3}m$, to monoclinic, $C2/m$. The implications for magnetic properties are discussed.

Keywords: Jarosites, iron-deficient jarosites, monoclinic jarosites, iron-site vacancy ordering in jarosites