American Mineralogist, Volume 106, pages 1534–1535, 2021

Controls on tetrahedral Fe(III) abundance in 2:1 phyllosilicates—Discussion

Sabine Petit[1,*], Fabien Baron[1], and Alain Decarreau[1]

[1]Institut de Chimie des Milieux et Matériaux de Poitiers (IC2MP), UMR 7285 CNRS, Université de Poitiers, F-86073 Poitiers Cedex 9, France

Abstract

Cuadros et al. (2019) used a wide range of data from dioctahedral and trioctahedral Fe^{3+}-bearing, 2:1 phyllosilicates to propose a model describing how tetrahedral occupancy by Fe^{3+} takes place in both dioctahedral and trioctahedral 2:1 phyllosilicates. The partition coefficient approach (Decarreau and Petit 2014) focusing on the distribution of Al^{3+} and Fe^{3+} between octahedral and tetrahedral sites of dioctahedral smectites has been disregarded in the study of Cuadros et al. (2019). This approach was applied here on the set of data from Cuadros et al. (2019). The partition coefficient value linked to the distribution of Al^{3+} and Fe^{3+} between octahedral and tetrahedral sites determined from natural and synthetic dioctahedral smectites applies well to trioctahedral phyllosilicates too. Data from synthetic iron-rich 2:1 smectites also fit well with both Cuadros et al. (2019) and Decarreau and Petit (2014) models.

Keywords: 2:1 phyllosilicates, tetrahedral Fe, partition coefficient, smectite, nontronite