

FLEISSTALITE, $\text{Fe}^{2+}(\text{SO}_3)\cdot 3\text{H}_2\text{O}$, A NEW SULFITE MINERAL SPECIESWalter, F.¹ & Bojar, H.-P.²¹Institute of Earth Sciences, University of Graz, Universitätsplatz 2, 8010 Graz, Austria²Department of Geosciences, Universalmuseum Joanneum, Weinzöttlstraße 16, 8045 Graz, Austria

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The new mineral fleisstalite was found in an alpine cleft at Mokritzen, Kleines Fleißtal, about 4 km W of the mountain Hoher Sonnblick, Carinthia, Austria. It occurs as spherical aggregates of prismatic, colourless crystals, elongated parallel to [010], up to 0.5 mm long and associated with quartz, muscovite, monazite-(Ce), siderite and pyrite. The mineral (IMA 2016-038) is named after its type locality Kleines Fleißtal.

The empirical formula is (average of 18 spots and based on 6 oxygens apfu) $(\text{Fe}_{0.92}\text{Mn}_{0.09})_{\Sigma 1.01}(\text{S}_{0.99}\text{O}_3)\cdot 3\text{H}_2\text{O}$. Fleisstalite is orthorhombic, space group $Pnma$, and its unit-cell parameters (at 100 K) are: $a = 9.554(5)$, $b = 5.534(3)$, $c = 9.429(5)$ Å, $V = 498.4(4)$ Å³, $Z = 4$. X-ray diffraction data indicate the structural relationship of fleisstalite to gravegliaite, the orthorhombic Mn-sulfite trihydrate (BASSO & LUCCHETTI, 1991). Least-squares refinement using anisotropic displacement parameters for all non-hydrogen atoms was carried out with the program SHELXL97 (SHELDRICK, 2008) and yielded $R1 = 0.057$ for 396 unique reflections with $F_o > 4\sigma(F_o)$. The basic structural unit in the fleisstalite structure is the chain built by two isolated Fe - $[\text{3O} + 3\text{H}_2\text{O}]$ - octahedra connected by two S which build SO_3 -groups (Fig. 1a). The chains are running indefinitely along [010] and are crosslinked by hydrogen bonds from 1.792 to 2.158 Å, yielding a three dimensional network (Fig. 1b).

The $(\text{Fe}^{2+}, \text{Mn})$ -sulfite trihydrate albertiniite (VIGNOLA et al., 2016) is monoclinic and a polymorph of fleisstalite. The crystal structure of albertiniite is built by a three-dimensional net of Fe-O-S interactions of 6-coordinated Fe atoms and sulfite groups.

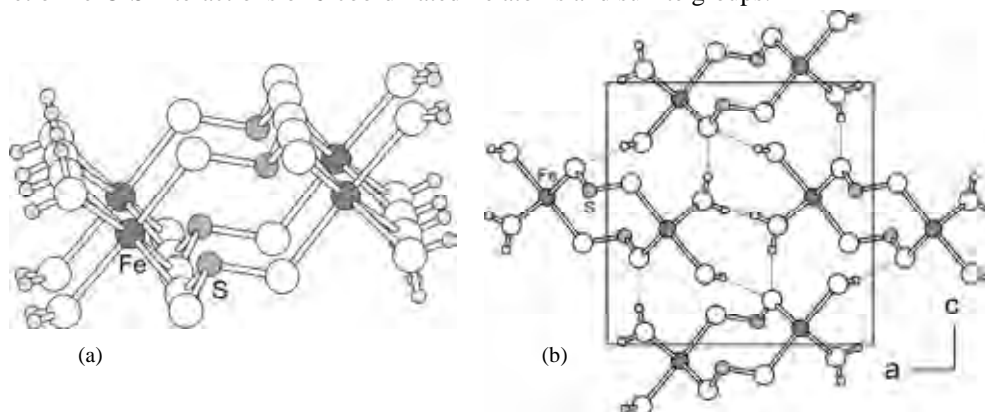


Figure 1. The basic structural unit of the fleisstalite structure is a indefinitely chain built by two Fe-octahedra and two sulfite-groups (a) and its projection along [010] with outlined (single lines) hydrogen bonds (b).

BASSO, R., LUCCHETTI, G. (1991): Z. Kristallogr., 197, 97-106.

SHELDRICK, G. M. (2008): Acta Cryst., A64, 112-122.

VIGNOLA, P. et al. (2016): Mineral. Mag., 80, 985-994.