

For 2020 the “Mineral of the Year” award has been assigned to bojarite, found and characterized by a research team led by Nikita Chukanov (Russian Academy of Sciences, Moscow). The full description of the new mineral is available here: [Chukanov, N.V., Möhn, G., Zubkova, N.V., Ksenofontov, D.A., Pekov, I.V., Agakhanov, A.A., Britvin, S.N., Desor, J. \(2020\): Bojarite,  \$\text{Cu}\_3\(\text{N}\_3\text{C}\_2\text{H}\_2\)\_3\(\text{OH}\)\text{Cl}\_2 \cdot 6\text{H}\_2\text{O}\$ , a new mineral species with a microporous metal-organic framework from the guano deposit at Pabellón de Pica, Iquique Province, Chile. \*Mineralogical Magazine\*, \*\*84\*\*, 921-927.](#)

Bojarite was discovered in a guano deposit on the northern slope of the Pabellón de Pica Mountain, 1.5 km south of Chanabaya village, Iquique Province, Tarapacá Region, Chile. The mineral occurs as blue fine-grained porous aggregates a few mm wide. Associated minerals are salammoniac, halite, chanabayaite, nitratine, and belloite (Fig. 1). Its ideal chemical formula is  $\text{Cu}_3(\text{N}_3\text{C}_2\text{H}_2)_3(\text{OH})[\text{Cl}_2(\text{H}_2\text{O})_4] \cdot 2\text{H}_2\text{O}$ , hence bojarite is a copper triazolate mineral.

Bojarite crystallizes in the cubic system, and has space group  $Fd\bar{3}c$ , with  $a = 24.8047(5)$  Å. The crystal structure of bojarite has been refined by the Rietveld method and is definitely elegant: three  $\text{Cu}^{2+}$  cations are linked by an hydroxyl anion at the center of an equilateral triangle and are also connected to two nitrogen atoms of the triazole ring, leading to the formation of  $[\text{Cu}_3(\text{trz})_3(\text{OH})]^{2+}$  building blocks [where  $\text{trz} = 1,2,4\text{-triazole anion } (\text{N}_3\text{C}_2\text{H}_2)^-$ ]. The third nitrogen atom of the triazole ring connects the triangular unit with adjacent units, giving rise to a three-dimensional network. The coordination of copper is completed by two longer bonds with chlorine atoms.

A fragment of the crystal structure containing the  $[\text{Cu}_3(\text{trz})_3(\text{OH})]^{2+}$  building block with additional  $\text{Cl}^-$  anions and three additional triazole rings is shown in Fig. 2.

Bojarite is a supergene mineral formed as the result of alteration of chanabayaite in the contact zone between a deeply altered bird guano deposit and chalcopyrite-bearing amphibole gabbro.

Bojaite is the ninth new mineral found in the guano deposit at Pabellón de Pica. It is worth noting that another mineral from that same occurrence, chanabayaite, was elected as the “Mineral of the Year” in 2015.



Figure 1. Blue interrupted crusts of bojarite on salammoniac-halite aggregate. FOV width 7 cm.

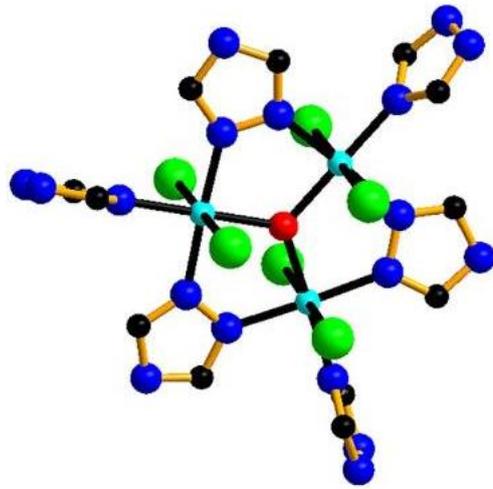


Figure 2. A fragment of the crystal structure of bojarite. Cu = light blue, O = red, Cl = green, N = dark-blue, C = black circles.