

**A new occurrence of xitieshanite [Fe³⁺(SO₄)Cl·6H₂O] crystals in acid-mine seepways,
Green Valley, Vigo County, Indiana, U.S.A.**

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ABSTRACT

A new occurrence of the rare efflorescent sulfate mineral xitieshanite [Fe³⁺(SO₄)Cl·6H₂O] has been documented from acid mine drainage (AMD) flows at Green Valley, Vigo County, Indiana, U.S.A. This represents only the second documented occurrence of the mineral, and is a new environment of deposition. Previously, xitieshanite had been documented only within the oxidation zone at the Xitieshan Mine, Quinghai Province, China. The presence of xitieshanite at Green Valley was confirmed through X-ray powder diffraction and chemical analyses. The mineral forms botryoidal semi-gelatinous lumps, as well as radiating clusters of light-green bladed and rod-like acicular crystals up to 1 mm long, in some cases pseudomorphically replacing melanterite. This is the only documented occurrence of the mineral as distinct observable crystals that indicate pseudomorphism. The xitieshanite forms following large summer storms that provide oxygenated waters in the AMD seepways, and a warm, humid environment of deposition. The chlorine in the mineral may originate from coal waste or anthropogenic sources related to de-icing operations at the mine plant.