

## Effect of the relative humidity on the oxidation of arsenopyrite and löllingite

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Humidity is an important factor in sulfide oxidation as it has been shown that sulfide minerals weather differently depending on the humidity. The formation of oxidation products is also determined by humidity [1].

Arsenopyrite (FeAsS) and löllingite (FeAs<sub>2</sub>) concentrates were placed under six relative humidities (RH) (75%, 81%, 85%, 94%, 98%, and 100% RH) for 30 months. These concentrates were periodically analyzed using X-ray diffraction (XRD) and oxalate extraction to determine the types and amounts of weathering products formed. Arsenolite (As<sub>2</sub>O<sub>3</sub>) was present in löllingite after 12 months in all experimental humidity conditions, whereas well-developed scorodite (FeAsO<sub>4</sub>·2H<sub>2</sub>O) crystals were detected in löllingite after 12 months in ≥85% RH conditions. In contrast, XRD-amorphous hydrous ferric sulfoarsenate was the predominant oxidation product of arsenopyrite after 12 months in all experimental humidity conditions.

Oxalate extractions showed that the amounts of weathering products generally increased with increasing RH in both mineral concentrates. Amounts of weathering products formed at RH ≥ 85% were substantially higher in löllingite concentrate, whereas amounts of weathering products in arsenopyrite concentrate were more pronounced at ≤71 RH.

[1] Jerz & Rimstidt (2003) *Am. Mineral.* **88**, 1919-1932.