# Carrollite - $CuCo_2S_4$

Hardness = 4.5 - 5.5. Cleavage: None observed. Attacked by $HNO_3$. Inert to HCl. Often partially to fully encased in a calcite/dolomite matrix in which the crystals are often cracked; removing too much matrix can cause the specimen to disintegrate. Remove matrix with vibratory impact tool or soaking overnight in a 1:1 solution of HCl and water. Derust with tartaric acid. Stable to $NH_4HF_2$ (but carbonate matrix is attacked). Some specimens tarnish after cleaning or etching from matrix.

References

Mindat: https://www.mindat.org/min-911.html

Handbook of Mineralogy: https://www.handbookofmineralogy.org/pdfs/carrollite.pdf

Gol, D. (2004) Removing iron oxides. Le Regne Mineral, 59 (5), 48-50. In French.

Hardinger, S. (2025) Mineral Specimen Cleaning and Development for the Amateur, 339 p.

Sinkankas, J. (1972) Gemstone & Mineral Data Book, 346 p. Winchester Press, New York.