



Unusual Preservation of Diagenetic Jarosite and Alunite in Jurassic Sandstones at Mollies Nipple, Kane Country, Utah, USA

Sally Potter-McIntyre (1) and Thomas McCollom (2)

(1) Southern Illinois University, Geology Department, Carbondale, IL, United States (pottermcintyre@siu.edu), (2) LASP, University of Colorado, Boulder, Colorado, USA (tom.mccollom@lasp.colorado.edu)

Sulfate minerals of the alunite-jarosite family are common in hyper-acidic modern systems such as acid mine drainage and fumarolic acid sulfate environments, and jarosite is a common tertiary product in sedimentary rocks as pyrite oxidizes during weathering. However, ancient jarosite- alunite is rarely preserved in sedimentary environments because these minerals are stable only under acidic conditions, and prolonged exposure to circumneutral diagenetic fluids dissolves them. In southern Utah, however, Jurassic sandstones at Mollies Nipple contain both jarosite and alunite cements. Paragenetic interpretation suggests these cements were precipitated during early to middle diagenesis. Possible explanations for the recalcitrant jarosite and alunite cements include: 1. Previous laboratory studies underestimate jarosite-alunite stability in natural settings and on geologic time scales, or 2. Interaction with organic polymers or inclusion of trace elements such as arsenic renders the crystal structure resistant. This study has implications for understanding biogeochemical subsurface interactions and interpreting diagenetic fluid chemistries.