Redcanyonite  \((\text{NH}_4)\text{Mn}[(\text{UO}_2)\text{O}_4(\text{SO}_4)_2](\text{H}_2\text{O})_4]\)

**Crystal Data:** Monoclinic.  
**Point Group:** 2/\(\text{lm}\).  
In radial aggregates, to 1 mm, composed of needles and blades, to 0.2 mm, flattened on \{010\}, elongated on \{100\}, and that exhibit \{001\}, \{010\}, \{101\}, and \{10\{1\}.  
**Twining:** By 180° rotation on \{100\}.

**Physical Properties:** 
**Cleavage:** Perfect on \{010\}.  
**Fracture:** Uneven.  
**Tenacity:** Brittle.  
**Hardness:** \(\sim 2\)  

D(meas.) = n.d.  
D(calc.) = 4.633-4.688  
Soluble in dilute HCl.

**Optical Properties:** 
**Translucent.**  
**Color:** Red-orange.  
**Streak:** Pale orange.  
**Luster:** Vitreous.  
**Optical Class:** Biaxial (+).  
\(\alpha = 1.725(3)\) \(\beta = 1.755(3)\) \(\gamma = 1.850(5)\)  
2V(meas.) = 60(2)°  
2V(calc.) = 61.3°  
**Orientation:** \(X = b\), \(Y \approx c^*\), \(Z \approx a\).  
**Dispersion:** Very strong, \(r < v\).  
**Pleochroism:** \(X = \) orange, \(Y = \) yellow, \(Z = \) orange.  
**Absorption:** \(Y << X < Z\).

**Cell Data:** Space Group: \(\text{C}2/\text{lm}\).  
\(a = 8.6572(17)\) \(b = 14.155(3)\) \(c = 8.8430(19)\) \(\beta = 104.117(18)\)°  
\(Z = 2\)

**X-ray Powder Pattern:** Blue Lizard mine, Red Canyon, San Juan County, Utah, USA.  
7.19 (100), 3.112 (72), 3.453 (56), 3.600 (33), 2.657 (23), 8.55 (21), 2.491 (21)

**Chemistry:**
\[
\begin{array}{ccc}
\text{Chem.} & (1) & (2) \\
\text{(NH}_4\text{)}\text{O}_2 & 3.41 & 3.48 \\
P_2\text{O}_5 & 0.10 & \\
\text{SO}_3 & 10.28 & 10.68 \\
\text{MnO} & 2.26 & 4.73 \\
\text{CuO} & 0.46 & \\
\text{ZnO} & 0.34 & \\
\text{UO}_3 & 74.27 & 76.30 \\
\text{H}_2\text{O} & [5.10] & 4.81 \\
\text{Total} & 96.22 & 100.00 \\
\end{array}
\]

1 Blue Lizard mine, Red Canyon, San Juan County, Utah, USA; average of 5 electron microprobe analyses supplemented by Raman and FTIR spectroscopy, H\(_2\)O calculated from structure; corresponds to \((\text{NH}_4)\text{Z}_2(\text{Mn}_{0.46}\text{Cu}_{0.09}\text{Zn}_{0.08})\text{Z}_2\text{Z}_2(\text{H}_2\text{O})_2(\text{UO}_2)\text{O}_4(\text{SO}_4)_2(\text{H}_2\text{O})_4\).  
2 \((\text{NH}_4)\text{Mn}[(\text{UO}_2)\text{O}_4(\text{SO}_4)_2](\text{H}_2\text{O})_4\).

**Mineral Group:** Zippeite group.

**Occurrence:** A secondary uranium mineral localized within organic-rich beds that are laced with uraninite and sulfides. NH\(^+\) inferred to be from decomposition of organic material.

**Association:** Ammoniozippeite, bobcookite, brochantite, devilline, gypsum, johannite, posnjakite, natrozippeite, pentahydrate, pickeringite.

**Distribution:** From the Blue Lizard mine, on the northern edge of Red Canyon, White Canyon district, San Juan County, Utah, USA.

**Name:** For the locality, Red Canyon in southeast Utah and in allusion to the red and orange hues of iron-stained sandstones within the canyon, which are also the striking color of the new mineral.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (66293, 66294, 66295, 66296, 66297, and 66298).

**References:**  