Ferrisicklerite and Sicklerite Discredited

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Last month I learned that the ferrisicklerite and sicklerite species had been discredited by the IMA. These "species" have been on New Hampshire species lists for well over a half a century, (e.g. Phillip Morrill *New Hampshire Mines and Mineral Localities*, 1960). These minerals are the lithium deficient alterations of triphylite and lithiophilite respectively. As recently as my 2008 *Fleischer's Glossary of Mineral Species* gives ferrisicklerite chemistry as $Li(Fe^{3+},Mn^{2+})PO_4$. Mindat .org currently gives the ferrisicklerite chemistry as $Li_{1-x}(Fe^{3+}{}_xFe^{2+}{}_{1-x})PO_4$. The only reference to this species demotion that I can find is the CNNMC Newsletter 70, 2022 that provides a single sentence "Sicklerite and ferrisicklerite have been discredited." Given that there are presently many valid species with "x" and "1-x" subscripts in their formulae, this short pronouncement is less than satisfying.

A query posted to the mindat.org general discussion group on how to re-label my ferrisicklerite and sicklerite specimens elicited a response from manager Ralph Bottrill: "They are probably mostly varieties of Triphyllite and Lithiophyllite respectively, but may be partly Heterosite and Purpurite: it will be hard to tell without determination of Li and the oxidation states, both relatively tricky! Maybe best called Triphyllite group without good analyses?"

The alteration progression is, (mindat.org formulae):

Triphylite: $LiFe^{2+}PO4$ -> Ferrisicklerite: $Li_{1-x}(Fe^{3+}{}_xFe^{2+}{}_{1-x})PO_4$ -> Heterosite -> $(Fe^{3+},Mn^{3+})PO_4$

Lithiophilite: $LiMn^{2+}PO_4$ -> Sicklerite: $Li_{1-x}(Mn^{3+}{}_xMn^{2+}{}_{1-x})PO_4$ -> Purpurite -> $Mn^{3+}(PO_4)$

Ferrisicklerite (brown), **Heterosite** (purple)
Parker Mtn. Mine, Strafford, NH. 4 cm specimen

Sicklerite (brown-minor), **Purpurite** (purple)
Turner Mine, Marlow, NH. 3 cm specimen

A few final notes:

It has always bugged me that triphylite is spelled with a "y", but lithiophilite is spelled with an "i". Heterosite is much more common in New Hampshire than purpurite, due to the more common occurrence of the parent triphylite over lithiophilite. It is not uncommon to see NH heterosite mislabeled as purpurite at mineral shows. To my knowledge, the Turner Mine is the only confirmed NH locality for purpurite. The Turner Mine purpurite find was made by Bob Wilken.