Triphylite mineral definition

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Lyalina, L. M., Selivanova, E. A., and Hatert, F.: Nomenclature of the triphylite group of minerals, Eur. J. Mineral., 35, 427–437, https://doi /10.5194/ejm-35-427-2023, 2023.

Is triphylite rare? As a mineral, no -- triphylite minerals are actually among the most common accessory phosphate minerals in granite pegmatites. But triphylite gemstones are very rare, and demand for them fluctuates.

Pictured above: Slightly green triphylite crystal with sharp faces; Rice Northwest Museum Collection | Image credit: Rob Lavinsky, iRocks - CC-BY-SA-3.0

Lithium ion (or Li-ion) batteries are rechargeable batteries that store energy by using the properties of lithium ions, making them sources of renewable, cleaner energy as they can be reused hundreds of times.

In fact, the 2019 Nobel Prize in Chemistry was awarded to John B. Goodenough, M. Stanley Whittingham, and Akira Yoshino for developing these batteries because they created so many options for wireless, fossil-free energy.

Pictured above: Massive or vein-filling triphylite specimen with small dark crystals on surface, probably vivianite; Academy of Natural Sciences Philadelphia Collection | Image credit: Rob Lavinsky, iRocks - CC-BY-SA-3.0

A lithium iron phosphate mineral, the formula for triphylite is LiFe2+(PO4). Some write the formula as Li(Fe+2, Mn+2)PO4 + Mg to account for the common impurities manganese and magnesium. Calcium is also a common impurity.

Manganese is often present in triphylite because it forms a series with the lithium manganese phosphate lithiophilite. Some triphylite specimens are intermediate, with varying iron to manganese ratios. Magnesium impurities can also substitute for iron or manganese.

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Web: https://www.hollanddutchtours.nl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346