

Alchemy in the 21st Century!

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The synthetic krettnichite analog, $\text{SrMn}_2(\text{VO}_4)_2(\text{OH})(\text{OH}_2)$, is a pseudo-3D metal-oxide framework. It is comprised of chains of edge-sharing MnO_6 octahedra that are linked by corner-sharing VO_4 tetrahedra to form layers in the (001) plane. Strontium is 8-coordinate and sits between the Mn-O-V layers. The electrical conductivity is anisotropic, giving higher conductivity within the Mn-O-V layers than between layers. TGA suggest loss of water around 450 °C, correlating with a decrease in conductivity. Anticipating a structural change due to loss of water, individual crystals were studied after heating. Instead of identifying the dehydrated phase, however, depending on the temperature and duration of the heating process, crystal structures suggest much more complex behavior—specifically formation of compositionally different phases within individual crystals. The structure of the room temperature krettnichite phase will be presented, along with the “apparent” structures of the new post-heating phases.

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