**THE DEHYDRATION AND ALTERATION OF CRONSTEDTITE.** L. Pohl[1] and D. T. Britt[1], [1]University of Central Florida, Department of Physics, 4111 Libra Dr, Orlando FL 32816, pohl@Knights.ucf.edu

**Introduction:** In our previous work we have determined the range of temperatures for the dehydration of the major hydrated constituents of carbonaceous chondrites. Serpentine group represents the most abundant hydrated minerals found in carbonaceous chondrites. This group has two significant end-members, the iron rich Serpentines, such as Cronstedtite and Magnesium rich Serpentines such as Antigorite or Lizardite. We have shown [1] that the onset of dehydration for Antigorite is at ~600C and the dehydration is complete at ~800-850C (see Fig. 1)

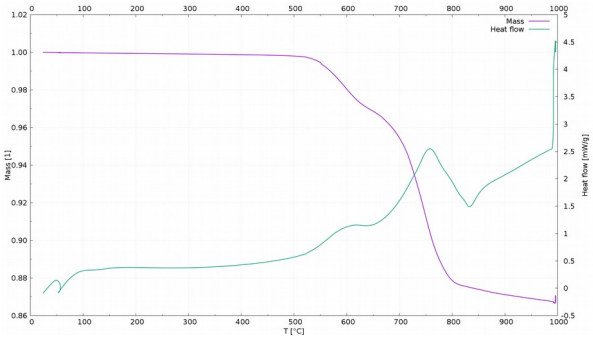


*Figure 1: Dehydration process of Antigorite*

Further, the onset of dehydration of Cronstedtite is at ~350C-400C and the dehydration is complete at ~550C, that is, the dehydration for iron rich end member occurs at over 200C lower temperatures than for Magnesium rich end member (See Fig. 2). The heat flows at the above dehydration temperature ranges suggest 3 phase transitions for Antigorite and at least 3 transitions for Cronstedtite. This work focuses on details of Cronstedtite dehydration.

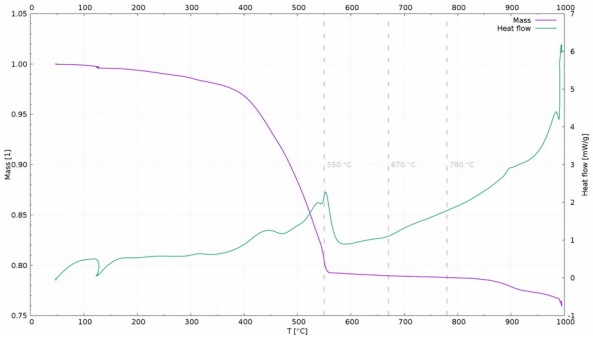


*Figure 2: Dehydration process of Cronstedtite*

**Methods:** Samples of Cronstedtite are heated in a simultaneous TGA-DSC measuring device to 350C at 20C/min and kept isothermally at that temperature for several minutes to allow them to equilibrate. Then the temperature is increased at constant rate to 400C and the sample is kept isothermally until no significant mass loss occurs. The sample is then removed from the oven and part of the sample is analyzed with powder X-Ray Diffraction technique to analyze changes in the sample's mineral phases and crystal structure. The other part is analyzed using reflectance spectroscopy. Next, the sample is treated analogously but heated to higher temperature, and the procedure is repeated.

**Samples:** We use samples of Cronstedtite that have been ground using mortar and pestle and sieved to a grain size of <53 μm. As in the preceding experiments, we run subsequent tests (XRD and Spectroscopy) as soon as possible after they have been taken out of the oven and in between the oven and the analysis the samples are stored in a desiccator.

**Preliminary results:** In this work, we will present the results of low temperature thermal alteration of Cronstedtite, including the temperature of individual phase transitions, changes in mineralogy after each phase transition and changes in reflectance spectra.

**References:**

[1] Pohl L. and Britt, T. D. (2017) DPS *50*, Abstract #505.03