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Characterization of Simulated Martian Nanocomposites with Alkali Perchlorate Salts CALRISSA ROE, BRITTANY BRODER, ED KINTZEL, KEITH ANDREW, SHANE PALMQUEST, MELINDA THOMAS, Western Kentucky University — As NASA is preparing for a manned mission to Mars in the 2030's, there is intense interest in the development of simulated Martian materials. Our team has synthesized novel simulated Martian cementitious materials, which incorporated carbon nanomaterials as well as alkaliearth and alkali-metallic salts. These chlorate and perchlorate salts are consistent with those found in the geologic recurring slope linnæ on Horowitz crater identified as a source of Martian water. The synthesized cements have the potential to be stronger, lighter weight, and more durable, which is of keen interest to manned Mars mission specialists. Sample characterization has used a combination of real space surface imaging at the NOVA Center using the Large Chamber Scanning Electron Microscope, elemental analysis using Energy Dispersive Spectroscopy (EDS), Atomic Force Microscopy (AFM), and Tip Enhanced Raman Spectroscopy (TERS). In combination with imaging, *in-situ* load frame measurements are carried out to compare the relative strengths of these prepared materials. A NASA goal is the development of the correct nanocomposites mixture that can subsequently be made by a surface robot sent to Mars several months prior to a manned landing for fabricating surface construction materials.

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