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PROFILING LUNAR DUST DISSOLUTION IN AQUEOUS ENVIRONMENTS: THE DESIGN  
CONCEPT

**Abstract**

Published studies and internal NASA reports show that when native lunar dust is suspended in aqueous solutions, a variety of ions are released, some of which are known toxins including iron, manganese and chromium. It has also been demonstrated that this release may continue for weeks to months. However, due to the very high surface area of lunar agglutinate dust and likely quickly released adherent nanoparticles, a “spiked” acute release of these compounds could occur prior to a prolonged release taking place, subjecting crew lung tissue to acutely high levels of toxins which may also enter the bloodstream. This has not been studied.

The investigation underway is not a toxicology study nor an examination of the direct effects of lunar dust on human health. Rather, it is a basic materials science investigation into how lunar dust behaves when exposed to water. Because biological tissues contain water, this will ultimately have relevance to human health. In addition, the knowledge gained from the work will likely impact the design of engineered environmental and life support systems for lunar habitats, EVA suit cleaning, ISRU, and any other situation where lunar dust might come into contact with aqueous solutions and give off dangerous or corrosive elements.

The paper will report on laboratory work performed by a NASA Engineering and Safety Center (NESC) team.