HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Near Term Strategies for Lunar Surface Infrastructure (1)

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# NEW TECHNOLOGY FOR CONCENTRATING MICROMETER-SIZE LUNAR DUST: PROCESS. APPLICATIONS TO HUMAN TOXICITY STUDIES, AND APPLICATIONS TO WATER PRODUCTION

**Abstract**

Using only ultrapure nitrogen gas as a medium, we have developed a new laboratory pneumatic system based on aerodynamic size sorting of lunar soil. Our laboratory version is operated in a nitrogen glove box. We have used this system to effectively concentrate the finest grain size from 200 grams of Apollo soil 14003. This concentrate is entirely within the respirable size range (less than 2 micrometers) and will be used to evaluate the potential toxicity of lunar soils for humans. The technology may also have applications on the moon for efficiently concentrating the finest fraction for resource extraction using a closed loop gas stream. This micrometer-size soil fraction may have many times the solar wind concentration of volatiles such as hydrogen as compared to bulk soil and has the potential of turning bulk mature soils from any site on the moon into ores for water recovery. A concept for a robotic technology demonstration will be discussed.