

Abstract Submitted
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The Effect of Long Term Space Environment Exposure on Optical Properties of Spacecraft Materials DANIELLE FULLMER, AMBERLY EVANS, J.R. DENNISON, JOSHUA L. HODGES, Utah State University — The Utah State University Material Physics Group took part in the State of Utah Space Environment & Contamination Study by flying samples on the International Space Station aboard the Materials International Space Station Experiment 6 payload. Pre-flight and post-flight analysis include density measurements to determine mass loss, optical microscopy, diffuse and specular reflectivity/absorptivity/transmissivity, and thermal emissivity/absorptivity. Post-flight measurements also include FTIR, SEM and STM. A primary objective of this project was to study the effects of prolonged exposure to the low earth space environment on the optical and thermal properties of the materials. Exposing these potential spacecraft materials allows us to characterize their performance in the space environment. The optical photographs show the physical damage inflicted on the materials by space. The reflection, absorption, and transmission measurements give insight to how the material interacts with the intense light of space and how it will accumulate charge, thus contributing to spacecraft charging. Emissivity determines equilibrium temperature in space.

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