

## **Cross Contamination of Martian Rock Samples**

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A 2007 Mars Science Laboratory (MSL) mission is being planned by the National Aeronautics and Space Administration (NASA), which will feature a precision landing capability to get to within approximately 5 km of a target site and collect Martian rock and regolith samples for the scientific analysis. The collected Martian rock samples will be subjected to processes that involve coarse and fine crushing followed by the various physical and chemical analyses. The sample crushing will be accomplished using a jaw crusher set at a gap of 1 mm to provide particles in size range of 1  $\mu\text{m}$  to 1 mm. The sample in between each processing step is transported through conveyor belt and gravity assisted chute. After the first sample is processed and analyzed, the same hardware is used to process the next sample. In this process scheme, the concern is the transfer of material from sample # 1 to Sample # 2 as a particulate contaminant. The extent of removal of fine particles attached to a conductive and nonconductive surface will determine the limits of cross contamination.

This paper presents the analysis we conducted to theoretically predict mass distribution in the particle size range of less than 10 $\mu\text{m}$ , 10 to 100 $\mu\text{m}$ , and larger than 100 $\mu\text{m}$  particles when a simulated Martian rock is crushed using a jaw crusher set at 1mm gap and various techniques that can be used to remove these particles.