

## **TXRF- A Critical Tool to Cleaning Success of NASA Genesis Solar Wind Samples**

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The NASA Genesis mission collected pristine solar wind ions in space between 2001 and 2004. Upon returning to Earth the space craft experienced a hard landing, shattering and contaminating solar wind collectors. For quantitative analysis of the solar wind embedded within the collectors, sample surfaces have to be carefully cleaned. In order to monitor the contaminant removal progress, total reflection X-ray fluorescence has been applied and has proven to be one of the most effective tools. The suitability of TXRF is due to its high surface sensitivity and non-destructive nature. Specific cleaning procedures were developed for several collector materials and were examined by TXRF before and after each step. Most cleaning involved an initial ultrapure water (UPW) spin and additional ultrapure acid application. Wherever possible cleaning was tested initially on control or spare collector materials to ensure that contaminants were not introduced by the process and the collector surface was not compromised. However, findings for non-flight samples are often not directly transferable to flight samples as radiation exposure in space changed the original surface chemistry. Ultimately, the goal of this study is to (1) assemble a data base listing the most suitable cleaning for each collector material and (2) summarize features of all cleaning procedures applied to each material.