

SIMS RESULTS FOR SOLAR-WIND ELEMENTAL ABUNDANCES FROM GENESIS COLLECTORS

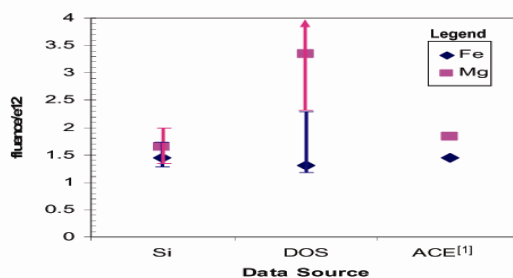
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Introduction: Solar wind elemental abundances are a major Genesis Science Objective. Spacecraft studies have shown that elements with first ionization potential (FIP) > 9 eV are fractionated relative to those with lower FIP compared with the solar photosphere; however, among elements with FIP < 9 eV (which make up most of the terrestrial planets) there is no evidence of fractionation. A major goal of Genesis is to provide a higher precision test of the lack of fractionation for FIP < 9 eV.

Method and Results: Accordingly, bulk solar wind analyses for several elements on a variety of Genesis solar-wind collector types are being made by SIMS using the ASU 6f and UCLA 1270 instruments. Fluences are calculated relative to implant standards; relative sensitivity factors (RSF's) are calculated for each set of analyses.

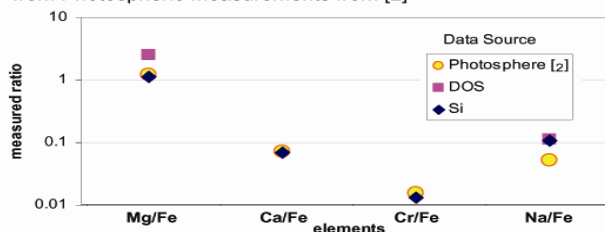
Figure 1 plots Fe and Mg measured in two collector types vs. ACE data [1]. Results for some elemental fluences, such as Fe, appear to be consistent across different collector types and techniques. Conversely, results for Mg differ based on collector type even though the solar-wind analytical profiles are clear and multiple standards were made (implanted) simultaneously.

Figure 1. Average (symbol) and full range (bars) of Genesis solar-wind data compared with ACE-derived fluences [1]



We currently have measured fluences for Fe, Mg, Ca, Cr, and Na, but are still investigating possible systematic analytical errors; accordingly, there are no error bars on Figure 2, below. New standards are currently being generated, to see if flight-induced changes (i.e., H-retention; radiation damage) affect the RSF's for the SIMS analyses. In any case, our data show a reasonably close correspondence with photospheric values at this point.

Figure 2. Comparison of Genesis Preliminary Measurements from Photospheric Measurements from [2]



References: [1] Reisenfeld D. et al. *in press*. ISSI Symposium on the composition of matter. [2] Asplund M. et al 2004. *in Cosmic Abundances as records of stellar evolution and nucleosynthesis*, Bash F. N. and Barnes T. G. eds.