Geophysical Research Abstracts, Vol. 8, 01277, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01277

Mineralogical correlation between HED meteorites and V-type asteroids

R. Duffard (1,2), D. Lazzaro (2)

(1) Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany (2) Observatorio Nacional, Rio de Janeiro, Brazil. (duffard@mps.mpg.de)

The correlation between specific meteorites and asteroids is a long-standing problem. The best-known correlation seems to be the HED–Vesta, although several problems still remain to be solved. A number of small asteroids exist with the same spectral characteristics as (4) Vesta, and are taxonomically classified as V-type, as Vesta. These small asteroids are mostly found in the region near Vesta, but some are also in near-Earth orbits, and one is in the outer part of the main belt. The purpose of this work is try to determine if the HED meteorites found on Earth and the small V-type asteroids are all genetically linked to Vesta through the comparative study of their mineralogy. We report the spectral reflectance analysis, 0.4-2.5 microns, of 47 basaltic achondrite meteorites and 22 V-type asteroids trying to associate spectral properties with mineralogy. The meteorite spectra are from 25 eucrites, 13 howardites and 9 diogenites, taken from the RELAB database. On the other hand, the spectra of 18 main belt asteroids and 4 NEOS were observed in different instruments/telescopes. We used the Modified Gaussian Model to fit the spectra to a serie of overlapping, modified gaussian absorptions. The fitted individual bands are validated against established laboratory calibrations. With spectral resolution extending to the near-infrared, we are able to resolve the presence of both high-calcium pyroxene (HCP) and low-calcium pyroxene (LCP) and, thus, use the HCP/(HCP+LCP) ratios to remotely trace igneous processing on asteroids. A search of this mineral provides a useful probe of differentiation.The high HCP/(HCP+LCP) ratios found require extensive differentiation of these asteroids and/or their primordial parent body. The degree of melting obtained for the eucrites, using the former ratio, is comparable with that obtained for all the V-type asteroids here analyzed, suggesting a comparable geologic history.