

Reflectance spectra of meteorites and asteroids – new results and applications?

L.J. PESONEN¹, THOMAS GOEPFERT^{1,2}, HILKKA ARKIMAA³ AND VILJO KUOSMANEN⁴

¹*Department of Physics, University of Helsinki, 00014 Helsinki, FINLAND (*correspondence: lauri.pesonen@helsinki.fi)*

²*Institute of Earth Sciences, University of Strasbourg, F-67084, Strasbourg, FRANCE*

³*Geological Survey of Finland, 02151 Espoo, FINLAND*

Reflectance spectroscopy is a useful tool to search links between meteorites and their parent asteroids. The variations of the spectra within a class, group or petrographic type can reflect surface conditions due to terrestrial or space weathering as well as due to metallic content or shock history of the bodies. We present a novel database of meteorite reflectance spectra (“MetRef”) based on literature and on our own measurements. So far the database consists of 105 spectra representing most chondrite and achondrite classes and groups. The spectra have been parametrized into bandwidths, depths and band areas. The database is coupled with other data such as finds and falls to allow terrestrial weathering effect to be studied, petrophysical properties, and various “alteration” indices. To study the effect of a body’s shape (e.g., sphere, ellipsoid, “binary”, “potato”, etc.), size, surface roughness (smooth, knobby, rubble pile) and metallic content on its spectra, we measured different Bjurböle (L/LL4 chondrite) pieces from our collections. The most striking effect is the distinct flattening of the spectra with increasing darkening due to increased metallic content. Here the new meteorite reflectance database is presented with examples of its applications.