MEASURING OF SOME BASALTS' SPECTRA WITH THE COMPARISON OF THE METAL METEORITE' SPECTRUM

Andrey K. Murtazov, Ryazan State University, Ryazan, Russia (46 Svobody St., Ryazan, 390000, Russia; akmurtazov@gmail.com)

The work describes the spectra of some basalt samples and volcanic lava samples obtained during optical experiments in the laboratory.

The task of measuring terrestrial rock reflectance spectra and their comparison with the spectra of meteoroids and asteroids is extremely important. It is related both to the Solar system body origin and evolution problem, and the problem of detecting space bodies dangerous for the Earth.

Researchers from many countries have accumulated extensive experimental and observational material as far as the comparison between spectral and photometric peculiarities of basic terrestrial rocks, stony asteroids, and meteorites.

We conducted the measuring of the lava and basalts reflectance spectra, based on the methods previously used for the experiments on physical simulation of photometric and spectral characteristics of satellite and asteroid surfaces.

In the presented research we used a small-size monochromator with a 3-4 nm/mm dispersion concave diffraction grating. As a receiving instrument, we used a photoconductor which is sensitive within the range of 400-900 nm.

The work presents the results of measuring the spectra reflected by the lava samples collected in the caldera of Teide, Tenerife, and also the spectra of reflection by a number of terrestrial basalt samples, iron fragment of Seymchan meteorite.

We also analyzed data of the S-asteroid spectra acquired from observations, as well as the experimental data on stony meteorites. The analysis resulted in marking the areas on the plane "wavelength-albedo" which occupy these surfaces.

The results we obtained are close to the multiple data obtained by different researchers. The simplest comparative analysis of volcanic lava and basalt spectra with the spectra of stony meteorites and asteroids shows, that visibly they are sufficiently similar.

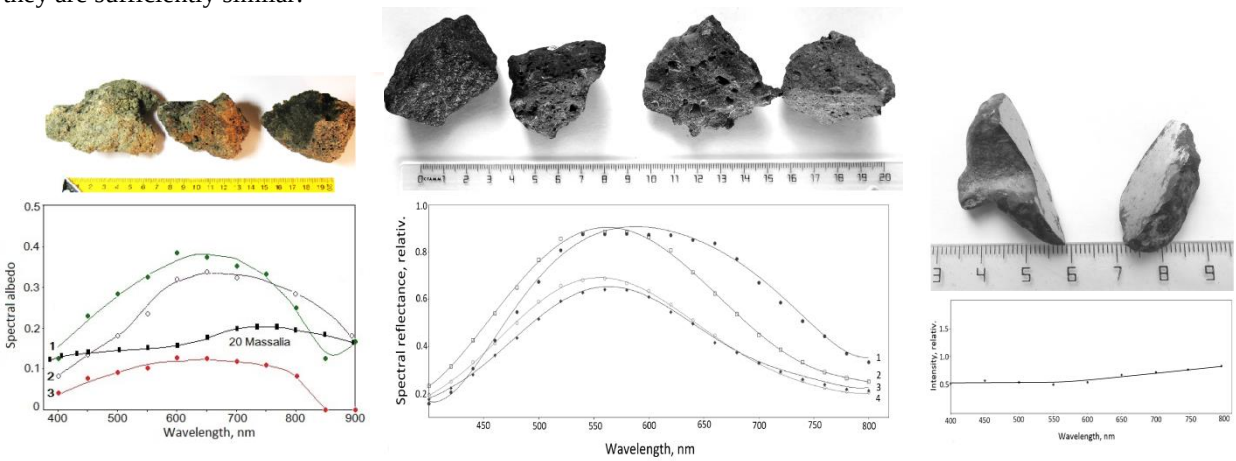

Figure 1. Spectra of: volcanic lava samples; different basalts; fragment of Seymchan meteorite

References

[1] Busarev V.V. (2016) *Solar system research* 50:13-23. [2] Chapman D., Morrison B., Zellner B. (1975) *Icarus* 25:104-–130. [3] Cloutis E.A., Gaffey M.J., Moslow T.F. (1994) *Icarus* 107:276-287. [4] Cloutis E.A., et al. (2011) *Icarus* 212:180–209. [5] Hiroi T., et al. (1993) *Icarus* 102:107-116. [6] Johnson T. V., Fanale F. P. (1973) *Journal of Geophysical research* 78:8507-8518. [7] McFadden L.A. et al. (2015) *Icarus* 259:150-161. [8] Moroz L.V., et al. (1996). *Icarus* 122:366–382. [9] Murtazov A.K. (2013) *American Journal of Modern Physics* 2:282-286. [10] Murtazov A.K. (2016) *Astronomical and Astrophysical Transactions* 29:519-528. [11] Murtazov A. K., Efimov A. V. (2017) *Ecological Bulletin of Research Centers of the Black Sea Economic Cooperation* 4:117-123. [12] Oetking P. (1966) *Journal of Geophysical Research* 71:2505–2513. [13] Pieters C.M., et al. (2012) *Nature* 491:79-82. [14] Trigo-Rodriguez J.M., et al. (2013). *MNRAS* 437:227-240. [15] Vernazza P., et al. (2008) *Nature* 454:858-860.