

ON SPECTRAL ALBEDO OF PHOBOS AND DEIMOS IN UV-RANGE;
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The diffuse-reflectance spectra of carbonaceous chondrites such as Orgueil, Staroye Boriskino, and Mighei were obtained with Hitachi EPS-3T spectrometer in spectral range 0.2 - 0.7 μm . There is essential difference between those and albedo spectral behaviour of the Mars satellites (1) at wavelength $< 0.3 \mu\text{m}$ /Fig.1/. We present the one of possible explanation of this fact in our work. Let us consider two possible cosmogenic processes which can occur on the Phobos/Deimos surfaces.

1.The carbon substance of the target and the pellet undergoes cleaning during impact processes being involved into the impact evaporation and condensation. The observed dark halos around some young craters can be associated with the clean carbon substance - pyrocarbon (2). We consider it possible that the global pyrocarbon contamination of the Phobos/Deimos upper regolith zones takes places.

2.The Phobos/Deimos surfaces are irradiated by solar wind protons with energies about 1 Kev. It is known, that proton irradiation of carbon target is followed by the organic films formation. We assume that pyrocarbon deposits on the Phobos/Deimos surfaces are transformed to organic compounds.

It is well known, that many organic compounds have the high UV-absorption being transparent in the visible range. The albedo of light scattering layer in UV-range will markedly decrease if semitransparent particles are covered by organic films, while the change of it in visible range will be weak. It was found that just that behaviour had the Phobos/Deimos spectra.

Solid pure graphite samples used in experiments were irradiated by proton beam with energy up to 10 Kev and dose about 10^{16} protons/cm². This dose corresponds to solar wind dose during about 100 years. This value is considerably smaller than that for Phobos/Deimos even if their surface renovation due to meteorite bombardment is taken into account. The possible contamination of the samples was carefully checked. Diffuse reflectance spectra of irradiated and nonirradiated samples were recorded in the similar way as the meteorite samples /Fig.2/. The albedo spectral dependence of the irradiated samples was similar to that of Phobos/Deimos not only in visible range but also at 0.2-0.3 μm , and this fact was especially important. Opposite to that the UV-albedo dependence of nonirradiated samples differed much from that of the Mars satellites.

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It is of especially interest to prove that peculiarity of UV-albedo spectrum is caused by chemical transformation but not by the destruction of sample upper layer. We repeated our experiments, but graphit samples were irradiated by α - particles instead of protons /Fig.2/. We can see that only the spectral curve of proton irradiated graphit sample decreases gradually with reduce of wavelength at $< 0.3 \mu\text{m}$. Thus, the laboratory experiments indirectly confirmed the possibility of organic films presence on regolith particles of the Phobos/Deimos surfaces.

- References: (1) Pang, K.D., et al. (1980) Nature, v.283, p.277.
 (2) Pronin, A.A. and Nikolaeva, O.V. (1982) Dokladi Akademii Nauk SSSR, v.265, No 2, p.429.

