

AN OPTICAL STUDY OF CARBONACEOUS CHONDRITES AND
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For an adequate interpretation of observational data on asteroids, laboratory optical studies of the meteorite matter are required. At present, a lack of optical data concerning carbonaceous chondrites and basalt achondrites has been revealed. Our investigations are aimed at partially filling in the flaw. The samples studied and some of their characteristics are listed in the Table. Spectra of the samples and phase dependances of their polarization factors were measured at small phase angles. The samples were taken from the collection of the Meteorite Committee of Academy of Sciences of the USSR.

Carbonaceous chondrites. Spectral curves of the albedo were measured with a Hitachi EPS-3T spectrometer, using an integrating sphere in the range 0.2 to 1.0 μm (see Fig.1). A characteristic distinction of these spectra from such of cosmic bodies of carbonaceous chondrite composition (e.g. Phobos and Deimos) consists in an increase of the albedo for wavelenghtes $< 0.3 \mu\text{m}$. The spectral curves of carbonaceous chondrites are, in general, similar to one another. However the differences are of special interest. For the purpose, spectra of the carbonaceous chondrites with respect to the Kainsaz meteorite (see No.4 in Table) were taken using the two-beams spectrometer CФ-18 within the range 0.4 to 0.7 μm . The results are shown in Fig.2. All the curves are normalized to the data for the wavelength 0.55 μm . All the carbonaceous chondrites samples measured display a strong negative polarization of reflected light (see Fig.3). Even the piece samples have shown a negative polarization. Hence, a negative polarization cannot serve as evidence for the existence of a small-grained regolith on the surfaces of atmosphereless cosmic bodies (1).

Basalt achondrites. The spectra were taken with the Hitachi EPS-3T spectrometer (see Fig.4). A spectral band can be seen near 1 μm . During the measurements, a weak band was suspected near 0.51 μm . To clarify the question, higher-dispersion measurements were performed with the CФ-18 spectrometer (see Fig.5), which have confirmed the reality of that band. The possibility existence of the band was earlier pointed out by D.I.Shestopalov (pers. comm.). Measurements of the polarization phase dependence have revealed a weak negative polarization (see Fig.6). In accordance with (1) this speaks an essentially more homogeneous microstructure with scale $\sim \lambda$ of basalt achondrite particles as compared with those of carbonaceous chondrites.

References: (1) Shkuratov, Yu.G., et al. Astronomichesky Vestnik (1984), v.18, No.3, p.161.

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Table

No.	name	t type	part. size	No.	name	t type	part. size
1.	Orgueil	C1	100 μm	7.	Allende	CV3	100 μm
2.	Murchison	CM3	100	8.	Allende	CV3	a piece
3.	Groznaya	CV3	100	9.	Kainsaz	CO3	a piece
4.	Kainsaz	CO3	100	10.	Chervony Kut	Evcrnit	200
5.	Mighei	CM2	100	11.	Stannern	Evcrnit	200
6.	Staroye Boriskino	CM2	100				

