

THERMOLUMINESCENCE IN SEPARATED CHONDRULES IN THE KAINSAZ CO CHONDRITE. V.G.Kashkarova, L.L.Kashkarov, G.V.Baryshnikova, A.K.Lavrukhina; V.I.Vernadsky Institute of Geochemistry and Analytical Chemistry, USSR Academy of Sciences, Moscow, USSR.

Thermoluminescence (TL) data obtained for the bulk samples the Allende CV and Kainsaz CO carbonaceous chondrites [1] indicated, that the TL in the Kainsaz bulk sample is characterized by more higher TL intensity and by presence of the low temperature glow peak for the natural TL. In the present paper we report the results of more detail investigation of TL in the Kainsaz including the individual chondrules, which is a smallest metamorphic degree meteorite among the CO-type carbonaceous chondrites [2].

TL was measured with a high-sensitivity equipment, that has made it possible to study TL in the samples by weight up to 0,05 mg at the temperature interval 50-500°C with the linear rate of heating 5°C sec⁻¹. The different types of the natural TL_{nat} glow curves, obtained in 30 chondrules under investigation are shown in Fig.1. It is seen from one to four the glow peak maximum at the temperature interval 240-430°C: low temperature peak at T=240±10°C (LT_{peak}) and high temperature peak at T=310±15°C (HT_{peak,1}), T=370±20°C (HT_{peak,2}), T=430±20°C (HT_{peak,3}). The errors indicated is about the average deviations observed for the glow peaks for the different chondrules. The TL_{nat} properties of the bulk meteorite sample appear to be the common characteristics of the individual chondrules. The histograms in Fig.2 (a,b,c) indicate the values of the TL_{nat} relations for these different glow peaks. It is seen a very wide interval of this relation values: from ~5·10⁻² to ~50, which indicates a very high complication of the TL_{nat} properties in the Kainsaz individual chondrules. The character of the artificial TL_{art} induced by gamma-ray of ¹³⁷Cs source in all chondrules under investigation is roughly the same. The typical TL_{art} glow curve is shown in Fig.1 (fifth glow curve) and exhibits only one intense low temperature emission at ~170°C followed by a less intense emission at 200-300°C. The values of (TL_{art}/TL_{nat})_{LT} accounted for chondrules under investigation is given in Fig. 2(d), which also indicate a factor of ~10³ between the limiting values of these distribution.

The mineralogy composition, the structure type and as it possible the different metamorphic history [3] dependence for the Kainsaz individual chondrules TL is considered.

References. 1. Lavrukhina A.K., Kashkarov L.L., Korotkova, Kalinina G.V., Kashkarova V.G.-Abstr.XV Lunar Planet. Sci.Conf., Houston, 1984, 471-472. 2. MeSween H.Y.-Geochim.Cosmochim.Acta, 1977, 41, 477-491. 3. Derek W.G., Sears M.H., Rubin A.E.-Geochim.Cosmochim.Acta, 1984, 48, 1189-1200.

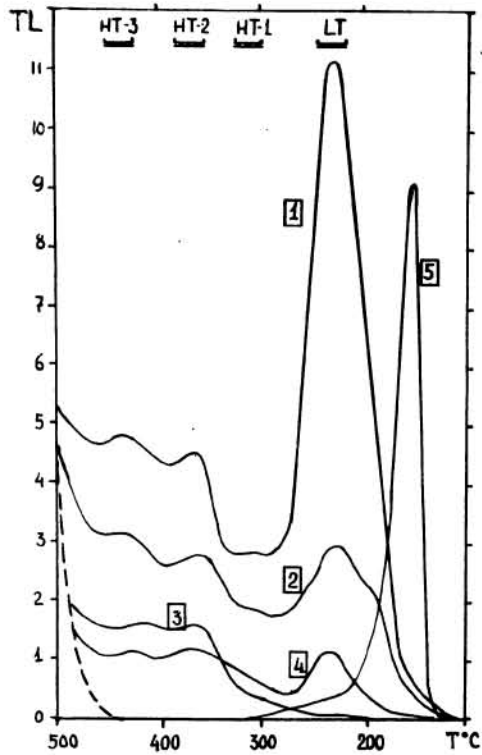


Fig. 1. Glow curves TL (arbitrary units) for the individual chondrules of the Kainsaz CO carbonaceous chondrite: (1-4) glow curves, TL_{nat} , (5) glow curve TL_{art} . Dashed line indicates a dark photomultiplier current at the temperature about 500°C.

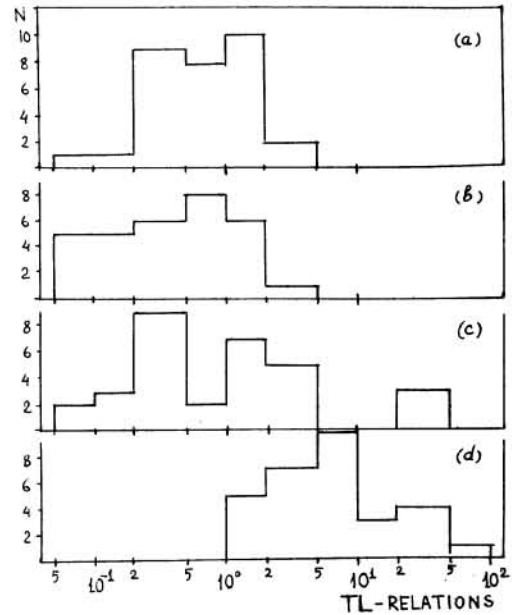


Fig. 2. Histograms of TL relations in the Kainsaz CO individual chondrules:
(a) $LT_{peak}/HT_{peak}, 1$,
(b) $LT_{peak}/HT_{peak}, 2$,
(c) $LT_{peak}/HT_{peak}, 3$,
(d) $(TL_{art}/TL_{nat}), LT$.