

VERY LOW DOSE OF THE PREACCRETION IRRADIATION FOR THE OKHANSK H4 CHONDRITE MATTER. L.L. Kashkarov and G.V. Kalinina. V.I. Vernadsky Institute of Geochemistry and Analytical Chemistry USSR Academy of Science, Moscow, USSR.

Recently we demonstrated /1-3/ that one of the main particularities of the VH-nucley tracks, observed in ordinary chondrites having no solar type gases, is the comparatively low track density ( $\rho$ ) that is by 2-3 order of magnitude lower than for the gas-rich meteorites. Thus the main experimental difficulty of these studies in the most cases is the small difference between  $\rho$  values in the crystals with anomalous track parameters and those irradiated by the galactic cosmic rays VH-nucley only. In this connection it was interesting to search the silicate grains with the anomalous track parameters in the sufficiently large chondrites having no solar-gas enrichment /4/. One of the suitable objects for this research is the Okhansk H4 ordinary chondrite (fall in 1887 yr, Permsky region, Russia), the total mass of the founded fragments of which is equal to 145 kg. The estimated by us preatmospheric radius of this meteorite is not smaller than 25-30 cm.

We have studied about 200 olivine crystals separated from 19 chondrules of microporphritic structure as well as from the meteorite matrix. Track records were studied using optical microscope on the internal cross section surface of the crystals 50-100 micron size, which were polished and etched by the standard method /5/.

In figure 1 we show a distribution of crystals studied on observed track density values. About 90% of the crystals under investigation have  $\rho \leq 10^4 \text{ cm}^{-2}$ . At the same time the rest of crystals have  $\rho \geq 10^5 \text{ cm}^{-2}$ . The part of chondrule crystals with  $\rho \geq 10^5 \text{ cm}^{-2}$  is approximately 3-4 times lower than for the matrix crystals.

All crystals which have minimum  $\rho$  value were checked for the track etching efficiency. For this goal the inner section surface of each crystal was repolished after the first etching cycle (during 24 hours) for the recognize of the natural VH-nucley tracks. Then an irradiation of crystals by the fission fragments of  $^{252}\text{Cf}$  source and second etching cycle by the same manner was doing. The clear fission fragment tracks were revealed after the etching during 12 hours in all control samples. Analogous results were obtained for the crystals with  $\rho$  values higher than  $10^5 \text{ cm}^{-2}$ . Examples of two photomicrographs are shown in figure 2.

Obtained results allow to conclude that discovered comparatively low  $\rho$  values  $(0,5-5) \cdot 10^5 \text{ cm}^{-2}$  which however are higher by the order of magnitude than the value  $\rho \leq 10^4 \text{ cm}^{-2}$ , can be caused by the irradiation on the early preaccretion stage of the meteorite parent body formation. The peculiarity of this irradiation was the low dose and

# VERY LOW DOSE OF THE PREACCRETION IRRADIATION L.L.Kashkarov and G.V.Kalinina

correspondingly low  $\rho$  values. Evidently if the average background track density from VH-nuclei of the galactic cosmic rays in any other meteorites will be higher (up to  $10^5$ - $10^6$   $\text{cm}^{-2}$ ) then observation of the possible small effect from preaccretion irradiation is not probably.

References: 1) Kashkarov L.L., Kalinina G.V. et al. - XIXth Lunar Planet. Sci. Conf., 1988, Abstr., p.589-590. 2) Kashkarov L.L., Kalinina G.V. - XXth Lunar Planet. Sci. Conf., 1989, Abstr. p.504-505. 3) Kashkarov L.L., Kalinina G.V. - XXIst Lunar Planet. Sci. Conf., 1990, Abstr., p.601-602. 4) Schultz L., Kruse H. Meteoritics, 1989, 24, p.155-172. 5) Krishnaswami S., Lal D. et al. - Science, 1971, 174, p.287-291.

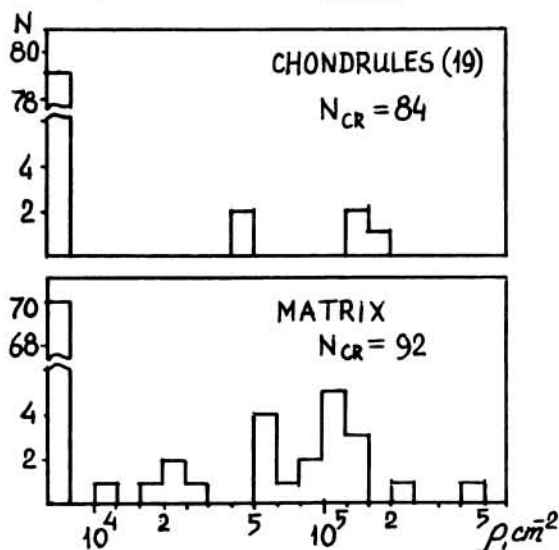


Fig.1 Histograms of track density distribution in the olivine crystals from chondrules and matrix of the Okhansk H4 chondrite.

Fig.2 Microphotographies of two (1,2) olivine crystals: (A)-first etching, (B)-second etching.

