

CURRENT RESULTS OF POTASSIUM-ARGON DATING OF THE KARA IMPACT STRUCTURE E.M.Kolesnikov (1), M.A.Nazarov (2), D.D.Badjukov (2), L.M.Lebedeva (1), and V.L.Myasnikova (1). 1 - Moscow State University, Geological Faculty, Moscow 119899; 2 - Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow

K-Ar age of the Kara impact structure was determined to be 65,8 +/- 1,0 my that is consistent with the K/T boundary age [1,2]. However ^{39}Ar - ^{40}Ar age of the Kara event was measured to be in the range of 71 - 81 my [3], the mean is 75,0 +/- 3,8 my (1 σ) my. The discrepancy is significant and demands us to study the Kara crater age in more details. In the work we carried out additional K-Ar analyses of Kara impact melts.

WHOLE-ROCK K-Ar ISOCHRONE. To check the whole-rock K-Ar isochrone reported by [1,2] we analysed 4 new samples having very different concentrations of K (from 0.66 to 7.67 wt.%). The obtained data are plotted on Fig.1 together with our earlier results and literature data. In contrast to [2], repeated analyses are averaged on Fig.1. Our new results did not change the clustering described by [2]. As before there is a main isochrone line accompanied by parallel groups. The clustering is demonstrated by the histogram on Fig.1 which shows distances of the points from the main line in the ^{40}Ar units. The new analyses make much preciser the estimate of the Kara crater age. The main isochrone shows the age of 65.6 +/- 0.5 (1 σ) my, and the computed joint age is 65.68 +/- 0.44 (1 σ) my.

INTERNAL K-Ar ISOCHRONE. Sample AN9-182 collected from a large body of impact melt was analysed to construct the internal K-Ar isochrone. The sample consists of 5 μm size crystals of feldspar and low-Ca pyroxene embedded into glass matrix. The 5-10 μm and 10-40 μm grain size fractions of the sample were separated in a heavy liquid into some fractions different in their density. Concentrations of K and ^{40}Ar in the bulk sample, the initial size fractions, and in the density fractions are shown on Fig.2. As it was expected both K and Ar contents are higher in light fractions. The obtained population of the K-Ar data can be approximated by a line indicating the age of 72.4 +/- 5.3 (1 σ) my. However the population is not homogeneous statistically in the direction of a lowest dispersion, that shows the histogram on Fig.2. A main trend in the population gives the age of 67.5 +/- 3.4 (1 σ) my. The points marked by crosses do not belong statistically the line. Three of them represent the bulk analyses of the initial size fractions and of the bulk sample. Measured concentrations of ^{40}Ar in the bulk materials are distinctly lower than those calculated on the basis of the ^{40}Ar concentrations in the density fractions. In spite of the absence of the ^{40}Ar mass balance the K mass balance is satisfactory.

DISCUSSION. The obtained K-Ar whole-rock isochrone age of 65.68 +/- 0.44 my coincides very well with data by [1,2] but the present estimate is 2 times preciser. The attempt to construct the internal K-Ar isochrone was not successful because of the lack of the ^{40}Ar mass balance. However in principle the internal isochrone age is compatible with the age obtained from the whole-rock isochrone, although the internal isochrone analysis does not

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lead to a more accurate estimate of the crater age. It seems that further K-Ar analyses will not be able to improve significantly the age estimation of 65.68 ± 0.44 my. Now ^{39}Ar - ^{40}Ar dating should be carried out in more details. If the obtained K-Ar age is correct, there is no doubt that the Kara and K/T events are synchronous.

REFERENCES: [1] Kolesnikov E.M. et al. (1988), In: Global catastrophes in Earth history, Abstracts, pp.99-100; [2] Nazarov M.A. et al. (1989) LPSC XX, pp.766-767; [3] Koeberl C. et al. (1989) Submitted to Global catastrophes in Earth history.

