

THE DENGLI (H3.8) CHONDRITE IS REGOLITHIC BRECCIA WITH SMALL EXPOSURE AGE. Assonov S.S., Yasevich A.N., Ivanova M.A. and Shukolyukov Yu.A., Vernadsky Institute of Geochemistry and Analytical Chemistry RAS, Kosygin str. 19, Moscow, 117975 Russia

Abstract. The noble gas data for Dengli (H3.8) breccia have been obtained. The correlation between cosmogenic component and trapped one is noticed. Calculated K-Ar age of Dengli is as high as 3.8 BY. Exposure age of meteorite may be lower than the values calculated by ^{21}Ne and ^{38}Ar .

The Dengli (H3.8) chondritic breccia found in the Karakum desert contains fragments of different lithology and has some terrestrial alteration products. The absence of dark-light structure as well as the absence of solar Kr and Xe and low abundance of trapped ^{36}Ar allowed us to conclude that Dengli is not regolithic breccia [1] and to suggest its nebular (accretional) origin [2]. The later measurements of light noble gases have evidently shown the presence of the solar component. All isotopic data are listed in table 1. High abundances of solar He and Ne and low abundance of trapped ^{36}Ar simultaneously are explained by unfractionated solar gases existence just in H-chondritic breccias [3]. In spite of the partial He losses during preliminary outgassing of samples the $^4\text{He}/^{20}\text{Ne}$ ratios in Dengli are as high as 414 and 338 (after correction for cosmogenic Ne). Thus the regolithic origin of Dengli breccia was confirmed.

Exposure ages were calculated using the mean production rates for H-chondrites $P_{21} = 0.309$ and $P_{38} = 0.449$ (in units 10^{-8} cc STP/g/My) [4,5]. The correlation between abundances of trapped and cosmogenic components found in this work can be plotted as trapped ^{36}Ar abundance vs. exposure age, because cosmogenic ^{21}Ne and ^{38}Ar abundances are the measure of exposure age (Fig.1). The similar correlation was observed for the dark part of Fayetteville (H4) breccia and was interpreted as a result of mixture of the fragments with different regolithic exposure history [6]. The absence of dark-light structure, correlation of trapped component abundances with exposure ages of samples and also lower abundances of solar gases in Dengli than in Fayetteville (H4) allowed us to assume the extremely inhomogeneous distribution of regolith-irradiated grains in nonirradiated substance as it was observed for Acfer 153 (H3-6) breccia [7], which also has no dark-light structure. The real exposure age of the meteorite consisting of irradiated and nonirradiated grains would be no more than the minimum value determined by stable spallogenic isotopes. As supposed by Alexeev and Gorin the low ^{26}Al content in Dengli (30 ± 0.6 dpm/kg) is due to either small exposure age or the large shielding depth in the preatmospheric body [8]. Large preatmospheric body appears to be excluded because of the absence of marked ^{80}Kr and ^{82}Kr excess (Figure 2) produced in the large bodies only.

THE DENGLE (H3.8) CHONDRITE.... Assonov S.S. et al.

Conclusions: 1. The Dengle (H3.8) ordinary chondrite is one more regolithic breccia.

2. When calculating the exposure age of brecciated meteorite samples, it is necessary to keep in mind that obtained values may be overestimated and are the mean values between meteorite exposure age and exposure duration of some fragments in regolith of parent body.

References: [1] Ivanova M. et al.(1993) LPSC XXIV, 695-696; [2] Ivanova M. et al.(1993) Meteoritics, 28, 371;[3] Pedroni A. and Begemann F.(1994) Meteoritics, 29, 632-642; [4] Eugster O. (1988) GCA 52, 1649-1662;[5] Eugster O. et al.(1993) GCA 57, 1115-1142; [6] Wieler R. et al.,(1989) GCA 53, 1441-1448. [7] Romstedt J. and Metzler K. (1994) LPSC XXV 1157-1158;[8] Alexeev V. and Gorin V. (1995) LPSC XXVI, 23-24. [9] O.Eugster et al. (1969) JGR 74, 15, 3874-3896. [10]O.Eugster et al. (1987) EPSL 84, 42-50.

Table 1. Abundances of noble gases in Dengle samples (in 10^{-8} ccSTP/g).

Sample, mg	^4He	$^3\text{He}/^4\text{He}$	^{20}Ne	^{21}Ne	^{22}Ne	^{36}Ar	^{38}Ar	^{40}Ar	^{84}Kr	^{132}Xe
365	n.a.	n.a.	n.a.	n.a.	n.a.	2.96	0.920	3810	0.026	0.019
192	n.a.	0.00092	n.a.	n.a.	n.a.	1.50	0.534	4030	0.022	0.011
43	46000	0.00103	119	6.69	17.6	6.19	1.87	3720	n.a.	n.a.
100	60000	0.00103	183	7.40	21.5	8.78	2.49	4650	n.a.	n.a.

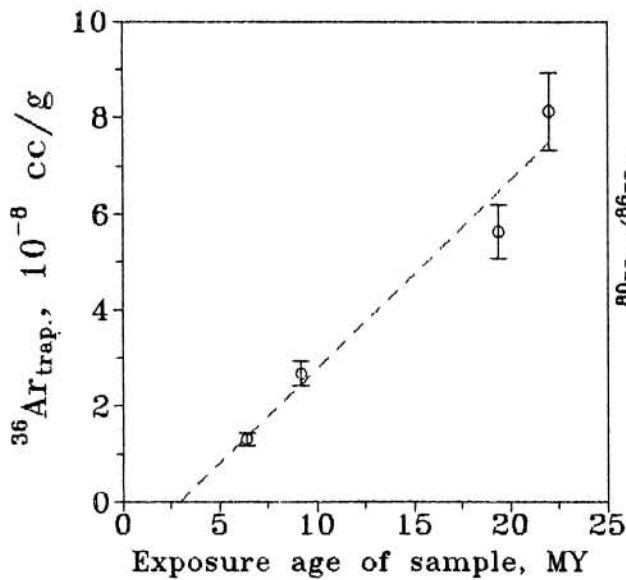


Fig. 1. Plotted ages are the mean values for ^{21}Ne and ^{38}Ar .

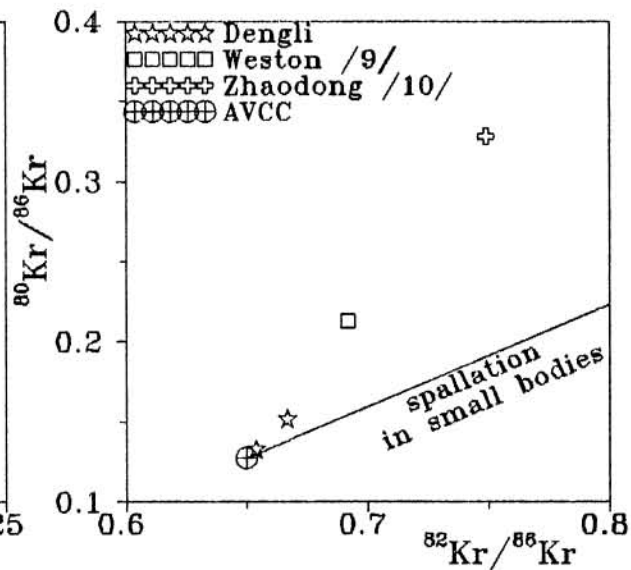


Fig. 2. Krypton in Dengle and ordinary chondrites with large preatmospheric body.