

RUMANOVA METEORITE

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Introduction: We present a summary of analyses of a meteorite found near the Rumanova village, Slovakia in 1994, the only one meteorite found in Slovakia in the last century. The meteorite was one piece 4.3 kg stone, density of 3.53 g/cm³ with evident degree of weathering and abundant chondrules of different size and structure. Rumanova is an H5 chondrite [1].

Cosmogenic nuclides A few cosmogenic nuclides were measured and their production rates calculated for meteoroids of Rumanova chemical composition and various radii. A terrestrial age of Rumanova based on cosmogenic ¹⁴C was estimated to about 12000 years, the exposure age is about 7 million years, and the K-Ar-age is 4.3 billion years.

One piece of the broken meteorite sample (985 g) was analyzed as a bulk sample. Later a 1.5 cm thick slide was cut, which was then divided into cubes of approximately 1.5x1.5x1.5 cm³ (~15 g). These subsamples were then analyzed in the coincidence gamma-ray spectrometer. Both annihilation (511 keV) and characteristic (1809 keV) peaks are well visible in the spectrum. The ²⁶Al massic activity of the bulk sample is 0.82 ± 0.03 Bq/kg of the meteorite.

The massic activities of ²⁶Al in subsamples varied between 0.62 ± 0.11 (close to the meteorite centre) and 1.45 ± 0.24 Bq/kg (on the meteorite surface). If we take into account estimated uncertainties, we see that there is a little variation between the ²⁶Al activities in surface subsamples and those taken from the interior of the meteorite. This is due to a small size of the meteorite, as the hadron cascade did not have enough space to develop in the meteorite [2-3]. A preliminary comparison of measured massic activities of ²⁶Al with Monte Carlo simulations suggests that a preatmospheric radius of Rumanova meteorite was around 10 cm.

Conclusions: A terrestrial age of Rumanova was estimated to about 12000 years, the exposure age is about 7 million years, and the K-Ar-age is 4.3 billion years.

The ²⁶Al analyses carried out in subsamples of the Rumanová chondrite have shown small differences between samples located in the surface and the interior of the meteorite. The obtained results suggest a small exposure size of the meteorite with the approximate radius around 10 cm.

References: [1] Rojkovič I., Šiman P. and V. Porubčan 1997 *Meteoritics and Planetary Science*, 32:A151. [2] Masarik J., Chochula P. and Povinec P. 1991. *J. Phys. G: Nucl. Part. Phys.*, 17:S493-S501. [3] Masarik J. and Reedy R.C. 1994. *Geochim. Cosmochim. Acta*, 58:5307-5317.