JESENICE (L6) – A RECENT METEORITE FALL FROM SLOVENIA

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Introduction: On April 9, 2009 at 3:00 CEST, a very bright fireball appeared over Carinthia and the Karavanke Mountains. The meteoroid entered the atmosphere in a very steep angle and disintegrated into a large number of fragments [1]. Several meteorite samples were recovered near Jesenice.

Sample recovery: The first fragment (~2.29 kg) of this fall was coincidentally recovered by local hikers on May 17, 2009 on Mt. Mežakla in the Upper Sava Valley [1]. A second rock of 361 gram was found on July 21, 2009, and a third one of 956 gram on August 27, 2009. The total weight is ~3.61 kg. The measured activity of short-lived cosmogenic radionuclides clearly indicates that the specimens of fragment 1 and fragment 2 result from a very recent meteorite fall [1].

Mineralogy and Chemistry: Jesenice is a highly recrystallized rock having only some relic chondrules visible in hand specimen and thin section. The texture, the homogeneous compositions of olivines and pyroxenes, and the large grain size of plagioclase clearly indicate that Jesenice is a type 6 chondrite. Based on the mean compositions of olivine and low-Ca pyroxene (Fa_{25} and Fs_{21}, respectively), the rock has to be classified as an L6 ordinary chondrite. The undulatory extinction in olivine and plagioclase and the presence of planar fractures in olivine indicate that the chondrite is weakly shocked (S3 [2,3]). The bulk composition of Jesenice is very close to that of other L6 ordinary chondrites. The meteorite has low abundances of trapped noble gases and is more weakly shocked than typical for L chondrites of petrologic type 6. Being weakly shocked and with gas retention ages of >1.7 Ga (^{4}He) and ~4.3 Ga (^{40}Ar), Jesenice seems not to have been strongly affected by the catastrophic disruption of the L chondrite parent body ~500 Ma ago [1]. Based on the analyses of all cosmogenic radionuclide concentrations it is suggested that the meteroid had a rather small pre-atmospheric radius of less than 20 cm. The concentrations infer a two stage or more complex irradiation history in comparison with the cosmogenic rare gas concentrations [1].

References: [1] Bischoff A. et al. 2010. *Meteoritics & Planetary Science* (submitted). [2] Stöffler et al. 1991. *Geochim. Cosmochim Acta* 55: 3845-3867. [3] Bischoff A. and Stöffler D. 1992. *European Journal of Mineralogy* 4:707-755.