

COSMOGENIC RECORDS IN THE DIDWANA-RAJOD METEORITE. B. S. Paliwal¹, V. K. Vaya¹, A. D. Shukla², S. Chakraborty², K. M. Suthar², M. H. Dixit², P. N. Shukla², and N. Bhandari, ¹Department of Geology, J. N. V. University, Jodhpur 342 005, India (bhandari@prl.ernet.in), ²Physical Research Laboratory, Navrangpura, Ahmedabad 380 009, India.

A single fragment weighing about 1 kg fell at Rajod, near Didwana in Western Rajasthan, on August 12, 1991, at about 10 p.m. IST. Mineralogical and petrological studies [1] indicate that the meteorite consists of enstatite, Fe metal, and troilite with abundant chondrules (0.1–5 mm), mostly with sharp boundaries. Chondrule fabric is highly varied, showing excentric, bar, swirling, radiating, porphyritic, and ringed structures. A few highly turbid/glassy chondrules are also present. Metamorphic degradation in chondrules is generally low and occasionally moderate. Metallic phase is 24% (6% sulfide). Trace amounts of plagioclase and trydimite are seen.

Chemical analysis using ICPAES and AAS gives concentrations of Fe (31.77%), Mg (14.08%), Al (1.05%), Ca (1.12%), K (0.086%), and Na (0.68%). Measurements of other major and trace elements are in progress now. Based on the presence of Orthoenstatite and the mg# (0.5), the chondrite can be classified as belonging to EH group.

We have also measured cosmogenic effects, i.e., cosmic-ray tracks and radionuclides, in this meteorite. Tracks were measured in enstatites and olivines using standard techniques [2]. The track density varies in a narrow range around $6.7 \times 10^5/\text{cm}^2$ in a few spot samples taken from the surface of this meteorite, indicating nearly uniform ablation all around. The activities of cosmogenic radionuclides ²²Na and ²⁶Al are estimated, by whole-rock γ -ray spectrometry [2], to be 64 ± 5 and 66 ± 5 dpm/kg respectively. Near absence of ⁶⁰Co indicates low thermal neutron exposure, suggesting that the meteoroid was a small body in space.

References: [1] Paliwal B. S. et al. (1997) *Current Science*, 73, 499–502. [2] Bhandari N. et al. (1998) *Meteoritics & Planet. Sci.*, 33, in press.