

**NEW CARBONACEOUS AND TYPE 3 ORDINARY CHONDRITES FROM THE SAHARA DESERT.** A. Bischoff<sup>1</sup>, H. Palme<sup>2</sup>, R.N. Clayton<sup>3</sup>, T.K. Mayeda<sup>3</sup>, T. Grund<sup>1</sup>, B. Spettel<sup>2</sup>, T. Geiger<sup>1</sup>, M. Endreß<sup>1</sup>, W. Beckerling<sup>1</sup>, and K. Metzler<sup>1</sup>. <sup>1</sup>Institut für Planetologie, Wilhelm-Klemm-Str. 10, 4400 Münster, Germany; <sup>2</sup>Max-Planck-Institut für Chemie, Saarstr. 23, 6500 Mainz, Germany; <sup>3</sup>Enrico Fermi Institute, University of Chicago, Chicago, IL 60637, USA.

From a total of about 300 new meteorite samples recovered from different locations in the Sahara desert in 1989, 1990, and 1991 (compare Meteoritical Bulletin No. 71, 1991), about 100 meteorites have been classified so far. Among these samples 12 type 3 ordinary chondrites (9 H3, 2 L3, 1 LL3) exist probably from 9 different falls. Three of the H3-chondrites are interesting chondritic breccias containing abundant H4-6 clasts. The LL3-chondrite Adrar-003 appears to be one of the most unequilibrated ordinary chondrites ever found. Among the other ordinary chondrites several spectacular chondritic breccias exist containing for example the rare phases ringwoodite and maskelynite (Acfer-040,-072, Hamada El Hamra-007). Besides two mesosiderites and one type IIIAB iron meteorite (Plateau du Tademait-002; Ni: 10.30 wt.%, Ga: 18 ppm, Ge: 33 ppm) a very interesting enstatite-rich meteorite exists that could be characterized as a metal-rich achondrite (Ilafegh-009).

The collection of Sahara meteorites contains a high proportion of carbonaceous chondrites. So far, 14 carbonaceous chondrites were identified resulting from at least five distinct falls (Table 1). Eight samples - CR-like chondrites (Acfer-059,-087,-097,-114,-139,-186,-187,-209) - were found within an area of approximately 45 x 12 km. A ninth CR-like sample (El Djouf-001) mineralogically very similar to and probably paired with the other eight meteorites (1) was found >500 km SW of the Acfer region. Acfer-097 has similar contents of Zn (60 ppm) and Se (4.68 ppm) to Renazzo; the refractory elements are enriched relative to CI by a factor of  $\approx 1.4$ . Two CV-chondrites (Acfer-082, Acfer-086) were identified. Their refractory elements Sc, REE, Hf etc. are enriched relative to CI by a factor of  $\approx 1.6$ . The sample Acfer-086 is contaminated by terrestrial products resulting in high Ca- and Sr-contents and the presence of abundant calcite. CAIs within Acfer-086 have a greenish appearance in thin section. Acfer-094 has trace element characteristics of CM-chondrites (Fe/Mn: 123; Se: 14.9 ppm; Zn: 205 ppm), but cannot be a CM-chondrite based on the oxygen isotopic composition (Table 1). Mineralogically, it appears to be a CO-chondrite. The samples Acfer-182 and -207 belong to a "unique" chondrite that clearly can be distinguished from the major chondritic groups by the peculiar mineralogical and chemical properties. They are similar to the anomalous chondritic breccia ALH85085 (2), but not identical. The Fe-content of 34.56 wt% is high like that of ALH 85085 (39.8 wt.%; (2)), and higher than in other carbonaceous chondrites. Like in ALH85085 the moderately volatile elements Na, K, Mn, Se, and Zn are depleted relative to CI by factors between 0.098 and 0.5. The refractory siderophile elements W, Re, Os, Ir, and Pt are enriched by a factor of  $\approx 2$  relative to CI.

**Table 1: Oxygen isotopes**

Sample	$\delta^{18}\text{O}$	$\delta^{17}\text{O}$	Class
Acfer-082	1.53	-2.93	CV3
Acfer-086	3.71	-1.48	CV3
Acfer-094	1.11	-3.91	CO/CM
Acfer-097	2.10	-1.53	CR
Acfer-182			unique
Ilafegh-013	3.68	2.66	H3

(1) Weber H.W. and Schultz L. (1991), this volume. (2) Bischoff A. et al. (1989), LPS XX, 80-81.