

KILABO AND BENSOUR: A COMPARATIVE STUDY OF TWO RECENT LL6 FALLS FROM AFRICA. K.J. Cole and P.P. Sipiera, Schmitt Meteorite Research Group, Harper College, Palatine, IL 60067, USA; psipiera@planets.org.

Introduction: The fall of a relatively rare meteorite is always an exciting event and when the situation repeats itself within a five-month period, it becomes very interesting. A possible explanation for this can be coincidence or perhaps maybe the two falls are actually related in some manner. The Bensour meteorite, which totals over 45kg, is reported to have fallen on February 11, 2002 along the Algerian/Moroccan border. Five months later on July 21st, a similar fireball was observed over Nigeria and subsequent meteorites were collected along a SE to NW line from Hadejia to the South to Kilabo to the North. The largest recovered mass (2kg) came to rest in the small town of Kilabo, with several smaller fragments being reported from various locations along the path of the fireball. The proposed name Kilabo (a.k.a. Hadejia) is pending the approval of the Meteoritical Society's Nomenclature Committee. In the present study the authors have examined both meteorites and have found that they are extremely similar in both their petrography and primary silicate mineralogy. With this in mind, perhaps both meteorites are related to a meteoroid stream that the Earth passes through at two different points in its orbit, much like the passage of a comet. The present paper will examine the mineralogy and petrology of both meteorites and compare this to other LL6 falls.

Analytical Procedure: The mineralogical data represented in the present study was obtained through established electron microprobe analytical procedures. The initial analysis and classification of the Kilabo, Nigeria meteorite, was conducted by Michael E. Zolensky, at NASA/ Johnson

Space Center (2002). A second analysis was conducted by Rhian Jones at the University of New Mexico's Institute of Meteoritics (2002). Additional microprobe analyses of both the Bensour and Kilabo meteorites were conducted by one of the authors (KJC) at the University of Illinois at Chicago, using the JOEL 733 electron-probe micro-analyzer. For comparison to the Bensour meteorite the authors relied upon the unpublished work of Frank Wlotzka, Max-Planck Institute for Chemistry (2002).

Results: Both the Bensour and Kilabo meteorites are micro-brecciated chondrites, that are very similar in appearance, and have fresh black fusion crusts. Apparently there are many examples of completely fusion-crustured individuals of Bensour, but no complete Kilabo individuals have yet been reported. Kilabo is a highly friable meteorite and was further subjected to breakage during its long journey from the field to the lab. In thin section, Bensour has a somewhat finer, more uniform grain texture than Kilabo, which exhibits larger grains in the matrix. There is a general lack of chondrules in both meteorites, though partial and relic chondrules are present. Metallic grains were also noted. The fayalite content of Bensour (Fa_{30.7}) compares very well to that of Kilabo (Fa_{30.9}) suggesting a common origin for both meteorites (Table 1).

Conclusion: One of the major problems confronting the researcher is the validity of the eyewitness reports of the fall of a meteorite. Concerning the Bensour fall there is virtually no specific information available other than associating a fresh fall with the report of a recent fireball. Accurate

information pertaining to the duration and direction of the fireball would be helpful, along with exact coordinates of the finds. Unfortunately this is apparently not available for Bensour. In the case of Kilabo there are enough eyewitness reports of the fall to establish a possible strewn field pattern. If one can assume that both falls are legitimate, and then perhaps these can be falls from a related meteoroid stream. When the five-month interval between the Bensour and Kilabo falls is compared to a list of other LL6 falls, an apparent pattern develops which suggests that other falls may be related to a similar source (Table 2). It has been suggested that a possible candidate for

the parent body of all LL's might be asteroid 3628 Boznemcova (1979 WD), though no spectral data yet exists for this object.

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Table 1. Comparison of microprobe analyses for the Bensour and Kilabo meteorites.

Analyst	Bensour	Kilabo
Wlotzka	Fa: 31 +/- 1	-
Zolensky	-	Fa: 31.1; Fs: 27.1
Cole	Fa: 30.7; Fs: 25.4	Fa: 30.9; Fs: 26

Table 2. Comparison of several LL6 chondrites by fayalite content and date of fall.

Meteorite	Fayalite Number	Date of Fall
Jolomba, Angola	31	February 3, 1974
Bensour, Algeria/Morocco	30.7	February 11, 2002
Niger	30	August 1, 1967
Kilabo, Nigeria	31.1	July 21, 2002