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Thermoluminescence measurements on meteorites from the Elephant Moraine Region: L6 showers and regional ice movements. P. H. Benoit and D. W. G. Sears. Cosmochemistry Group, Dept. Chemistry and Biochemistry, University of Arkansas, Fayetteville, Arkansas 72701, USA.

As part of their initial characterization, we have completed natural and induced thermoluminescence (TL) measurements for over 800 Antarctic meteorites. We have previously discussed the implications of these data for pairing, terrestrial age, and meteorite concentration mechanism at the Lewis Cliff and Allan Hills sites (Benoit *et al.,* 1992a,b). Here we report data for meteorites from the Elephant Moraine region (designated EET; see Huss, 1990, for description of region). Our present discussion is limited to meteorites collected in the 1986/87 and 1987/88 field seasons; measurement of samples from the 1990/91 field season are underway.

The Elephant Moraine region encompasses at least five meteorite-bearing blue icefields, including Elephant Moraine proper (EM), Meteorite City (MC), Upper Meteorite City (UMC), Texas Bowl (TB), and the Northern Ice Patch (NIP). While MC, UMC, and TB are physically adjacent to each other, EM and NIP are separated from the others, the latter being approximately 40 km distant from UMC. We have previously identified numerous pairing groups within the EET database without regard for field location. While most pairing groups are found to be restricted to single fields, there is a significant number which span several fields. The howardite group EET87503 covers both TB and EM and several L6 groups either span TB and EM or span the physically adjacent TB, UMC, and MC icefields. Even the isolated NIP apparently shares a few pairing groups with UMC and TB, although the small number of samples from this field make comparison difficult. This result seems to indicate that, unlike the Allan Hills sites, the individual ice fields at EET are sampling the same meteorite population.

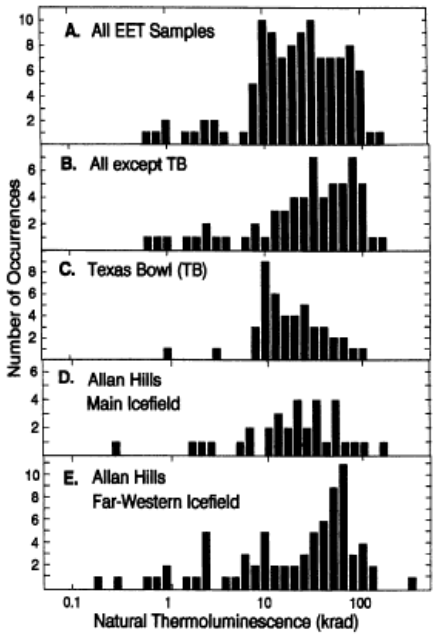

FIG. 1. Natural TL data for (A) EET ordinary chondrites, (B, C) broken down by icefield, and for ordinary chondrites from (D) Allan Hills Main and (E) Farwestern icefields.

Natural TL levels for EET meteorites (Fig. 1) are generally high, with a significant fraction having TL levels greater than 50 krad. This would suggest that, in general, these meteorites have small terrestrial ages, probably <100,000 years for most meteorites. In this sense, the region is comparable to the Yamato sites. The cumulative histogram and the data for TB show a large number of meteorites with low TL (<30 krad), which would suggest this field is older than the others. However, the low TL "hump" in the TB data is caused almost entirely by three large L6 pairing groups (EET87587, EET87596, and EET87601), which are probably paired with each other. This suggests that the TB data are dominated by a relatively old L6 shower, but that the meteorites at the site, in general, have short terrestrial ages similar to the other icefields.

The short terrestrial ages of the EET meteorites might suggest a connection with the meteorites of the Farwestern icefield at Allan Hills. However, induced TL peak temperature and width data show that the unusual H5 group observed at the Allan Hills sites (including the Farwestern field, Benoit and Sears, 1992) is absent at all EET sites. This suggests that the meteorites at the EET sites have shorter terrestrial ages than those from the Farwestern field at Allan Hills, despite a possible link between these sites suggested by recent ice flow determinations (Schultz *et al.,* 1990; Delisle and Sievers, 1991).

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