THE NATURAL THERMOLUMINESCENCE OF ANTARCTIC METEORITES AND ITS RELATIONSHIP WITH Al-26 CONTENT

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Natural thermoluminescence (TL) may provide information relevant to terrestrial age, and thereby (i) the secular variation in the source of meteorites to earth, (ii) identifying fragments of a single fall, and (iii) the mechanisms by which ice movements cause the concentration of large number of meteorites in the Antarctic (Bull and Lipschutz, 1982; Dennison *et al.*, 1986; Scott, 1984). It also provides data on the pre-fall thermal and radiation history of meteorites (McKeever, 1982; McKeever and Sears, 1980; Sears, 1975; Sears and Durrani, 1980). The natural TL levels of 23 equilibrated chondrites from Antarctica have been measured and compared with Al-26 activities measured by Evans *et al.* (1982). The results appear in Figure 1. Seventeen of the meteorites were found to lie on a band of increasing natural TL and Al-26 activity; meteorites with Al-26 of 45-60 dpm/kg have natural TL values (normalized to high temperature TL) of 2-4, where as those with Al-26 values of 30-45 dpm/kg have normalized natural TL values of 1-2, and ALHA 76008, with an Al-26 content of 11 dpm/kg has a TL value of 0.87 ± 0.01. Apparently, the "half-life" for TL decay is comparable to that of Al-26. The six meteorites not lying on the TL vs Al-26 trend have much lower TL than others of comparable Al-26, presumably due to unusual thermal/radiation histories. Two of them, RKPA 79001 and RKPA 80202 (which may be paired) show evidence of severe shock (Score *et al.*, 1981). A factor of five difference in the natural TL of the present sample of ALHA 77294 and one we have previously measured (0.48 ± 0.01, compared with 2.12 ± 0.06) may be due to differences in cosmic-ray shielding. The remaining three, ALHA 78006, ALHA 77296 and ALHA 77297 (of which the last may be paired, Score *et al.*, 1981) have probably suffered a recent reheating such as would be expected from orbits of unusually small perihelia.

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