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Thermoluminescence in Chondritic Mineral Separates—A Preliminary Report. J. David Batchelor and Derek W. G. Sears. Cosmochemistry Group, Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR 72701 USA.

It has been shown that plagioclase feldspar is the predominant thermoluminescence (TL) phosphor in chondritic meteorites. Van Schmus and Wood (1967) recognized the presence of secondary feldspar in chondrites of type 4 and higher, and specified the presence of well developed plagioclase as a defining characteristic of type 6. Van Schmus and Ribbe (1968) found plagioclases ranging from An 8 to An 16 in type 6 chondrites. Their X-ray diffraction studies showed a moderately high degree of disorder with [20(131)-20(131)] about 1.75 and with little spread. They saw no evidence for crystallographically distinct K-feldspar. Lalou *et al.* (1970) examined mineral separates from Saint Séverin (LL6), and found that about three-fourths of the TL signal (71% for the induced TL and 78% for the natural TL) was due to plagioclases, with about 10% from Merrillite/Whitlockite. They reported that 8% of the induced TL and 3% of the natural TL was in the olivine fraction. McDougall (1968) reported only a very weak TL signal from olivine at temperatures above 425 °C. Pasternak (1978) reported that the TL peak temperature (Tmax) of albite increased with thermally induced Al/Si disorder, and Guimon *et al.* (1984) showed that annealing of a type 3.5 ordinary chondrite caused the peak to broaden and move to a higher Tmax.

We are attempting to demonstrate a correlation between Tmax and degree of ordering of feldspar in ordinary chondrites. We have performed mineral separations by heavy liquids on Bruderheim (L6), Dhajala (H3.8), and ALHA 77214,55 (L3.4). Each sample was ground, and the magnetic fraction separated. Density separation was by float/sink in heavy liquids. Each split was acetone washed, and its natural and induced TL measured. Each fraction was then further ground, and X-ray diffraction patterns obtained.

The bulk material showed TL levels of 1.4 for Bruderheim and 0.069 for ALHA 77214 (Dhajala = 1), consistent with their petrologic types. Peak temperatures were at 198 °C for Bruderheim, 160 °C for Dhajala, and 128 °C for ALHA 77214, as expected for their petrologic types. The first separation was done in CH_2I_2 with a measured density of 3.30 g/cc. Each meteorite showed 12 to 20% light material. ALHA 77214 and Dhajala both showed a 3-fold enhancement in the TL of the light fraction, but Bruderheim showed an 11-fold enhancement, consistent with feldspar being the major phosphor and its larger feldspar crystal size. X-ray diffraction showed the presence of olivine and pyroxene in all fractions, but only the 040 line for oligoclase. Further separations will be done at densities of 2.6 and 3.0 g/cc to extract the plagioclase component.

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