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## Thermoluminescence Study of Chondrites

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Induced TL (thermoluminescence), the response of a luminescent phosphor to a laboratory dose of radiation, reflects the mineralogy and structure of the phosphor, and provides valuable information on the metamorphic and thermal history of meteorites. Especially the sensitivity of the induced TL is used to determine petrologic subtype of unequilibrated ordinary chondrites [1]. Natural TL, the luminescence of a sample that has received no irradiation in the laboratory, reflects the thermal history of the meteorite in space and on Earth. Natural TL data thus provide insights into such topics as the orbits of meteoroids, the effects of shock heating, and the terrestrial history of meteorites [2]. Natural TL properties are usually applied to find paired fragments [3-5].

This time we measured induced and natural TL properties of new twenty-four Yamato chondrites from Japanese Antarctic meteorite collection. Sampling positions of these chondrites were measured by GPS.

Most of the chondrites had TL sensitivities over 0.1 (Dhajala=1), corresponding to petrologic subtype 3.5-3.9. One chondrite, Y981221 (H3), was revealed to be a primitive ordinary chondrite, petrologic subtype 3.2-3.3. It is particularly significant in understanding the nature of primitive material in the solar system.

Natural and induced TL properties were also applied to find paired fragments. We found eight potential paired fragments, i) Y981275 - Y981285(L3), ii) Y981175 - Y981186(H3), iii) Y981278 - Y981283(L3), iv) Y981275 - Y980593(L3), v) Y981283 - Y980453(L3), vi) Y981301 - Y981285(L3), vii) Y981140 - Y980660(H3), viii) Y980593 ? Y981285(L3) by TL, satisfying the criteria of 1) the natural TL peak height ratios, LT/HT, should be within 20%; 2) that ratios of raw natural TL signal to induced TL signal should be within 50%; 3) the TL peak temperatures should be within 20°C and peak widths within 10°C.

### References

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