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Natural Thermoluminescence (NTL) Data for Antarctic Meteorites

Paul Benoit, Joyce Roth, Hazel Sears, and Derek Sears
Cosmochemistry Group
Dept. of Chemistry and Biochemistry
University of Arkansas
Fayetteville, AR 72701

The measurement and data reduction methods were described by Hasan et al. (1987, Proc. 17th LPSC E703-E709; 1989, LPSC XX, 383-384). For meteorites whose NTL lies between 5 and 100 krad, the natural TL is related primarily to terrestrial age. Samples with NTL <5 krad have TL below that which can reasonably be ascribed to long terrestrial ages. Such meteorites have had their TL lowered by heating within the past million years or so (by close solar passage, shock heating, or atmospheric entry), exacerbated, in the case of certain achondrite classes, by "anomalous fading". We suggest that meteorites with NTL > 100 krad are candidates for an unusual history involving high radiation doses and/or low temperatures. NTL data for 40 Allan Hills meteorites collected by EUROMET in 1988 have been published in Meteorical Bulletin 71 (Meteoritics 26:3).

Sample	Class	NTL [krad at 250 deg. C]	Sample	Class	NTL [krad at 250 deg. C]
EET90001	C4	1.1 ± 0.1	QUE90229	L5	9.4 ± 0.1
EET90005	C4	1.2 ± 0.4	QUE90230	L5	14.8 ± 0.1
EET90006	C4	<1	QUE90231	L5	7.3 ± 0.1
EET90008	C4	0.4 ± 0.1	QUE90232	L5	6.6 ± 0.1
EET90009	C4	0.7 ± 0.1	QUE90233	L5	9.4 ± 0.1
EET90013	C4	<1	QUE90234	L5	7.6 ± 0.1
EET90016	C4	0.6 ± 0.1	QUE90235	L5	14.2 ± 0.1
EET90025	C4	2.1 ± 0.3	QUE90236	L5	0.7 ± 0.1
			QUE90237	L5	5.5 ± 0.1
WIS90302	H5	63.5 ± 0.1	QUE90238	L5	4.2 ± 0.4
			QUE90239	L5	32.6 ± 0.1
QUE90204	H6	1.0 ± 0.1	QUE90240	L5	3.2 ± 0.4
			QUE90241	L5	9.9 ± 0.1
QUE90205	L5	0.6 ± 0.1	QUE90242	L5	3.2 ± 0.3
QUE90206	L5	1.4 ± 0.4	QUE90243	L5	7.1 ± 0.1
QUE90207	L5	9.7 ± 0.1	QUE90244	L5	9.7 ± 0.1
QUE90208	L5	10.3 ± 0.1	QUE90245	L5	5.1 ± 0.1
QUE90209	L5	8.5 ± 0.1	QUE90246	L5	11.4 ± 0.1
QUE90210	L5	1.2 ± 0.2	QUE90247	L5	2.5 ± 0.5
QUE90211	L5	0.3 ± 0.1	QUE90248	L5	10.3 ± 0.1
QUE90212	L5	0.6 ± 0.1	QUE90249	L5	0.7 ± 0.2
QUE90213	L5	10.7 ± 0.1	QUE90250	L5	6.6 ± 0.1
QUE90214	L5	12.3 ± 0.1	QUE90251	L5	0.6 ± 0.1
QUE90215	L5	8.8 ± 0.1	QUE90252	L5	14.3 ± 0.1
QUE90216	L5	11.8 ± 0.1	QUE90254	L5	6.9 ± 0.1
QUE90217	L5	1.5 ± 0.1	QUE90257	L5	12.1 ± 0.1
QUE90218	L5	34 ± 3	QUE90258	L5	10.1 ± 0.1
QUE90219	L5	12.3 ± 0.1	QUE90259	L5	10.0 ± 0.1
QUE90221	L5	0.5 ± 0.1	QUE90260	L5	9.7 ± 0.1
QUE90224	L5	2 ± 2	QUE90261	L5	3.3 ± 0.7
QUE90225	L5	9.5 ± 0.1	QUE90263	L5	0.7 ± 0.3
QUE90226	L5	0.3 ± 0.1	QUE90264	L5	4 ± 1
QUE90227	L5	2.1 ± 0.1	QUE90267	L5	2.4 ± 0.5

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Sample	Class	NTL [krad at 250 deg. C]	Sample	Class	NTL [krad at 250 deg. C]
QUE90271	L5	3.1 +- 0.2	WIS90300	L5	197.1 +- 0.1
QUE90272	L5	12.1 +- 0.1	WIS90303	L5	5.9 +- 0.1
QUE90282	L5	10.1 +- 0.1			
QUE90283	L5	5.4 +- 0.1	QUE90222	L6	11.3 +- 0.1
QUE90285	L5	3.7 +- 0.2	WIS90301	L6	40.2 +- 0.1

The quoted uncertainties are the standard deviations shown by replicate measurements of a single aliquot.

COMMENTS: The following comments are based on natural TL data, TL sensitivity, the shape of the induced TL glow curve, classifications, and JSC and Arkansas group sample descriptions.

QUE90222 (L6) and QUE90226 (L5) may have been shocked.

Pairings (Confirmations of pairings suggested in AMN 15:1 and 15:2):

C4: EET90001, EET90005, EET90006, EET90008, EET90009, EET90013, EET90016, and EET90025 with EET87507

L5: QUE90207, QUE90208, QUE90209, QUE90213, QUE90214, QUE90215, QUE90216, QUE90219, QUE90225, QUE90229, QUE90230, QUE90231, QUE90232, QUE90233, QUE90234, QUE90235, QUE90237, QUE90241, QUE90243, QUE90244, QUE90245, QUE90246, QUE90248, QUE90250, QUE90252, QUE90254, QUE90257, QUE90258, QUE90259, QUE90260, QUE90272, QUE90282, and QUE90283.

L5: QUE90205, QUE90206, QUE90210, QUE90211, QUE90212, QUE90217, QUE90221, QUE90224, QUE90227, QUE90236, QUE90238, QUE90240, QUE90242, QUE90247, QUE90249, QUE90251, QUE90261, QUE90263, QUE90264, QUE90267, QUE90271, and QUE90285.

Pairing of the QUE90205 group with the QUE90207 group is possible.

L5: QUE90201 and QUE90202 (TL data reported in AMN 15:1) are paired with the QUE90207 group.