

Beta Counting

The file "beta counting.pdf", contains records of Thick Source Beta Counting (TSBC. Sanderson, 1988) measurements on all samples for which luminescence dates were determined.

Sanderson, D.C.W. (1988). Thick Source Beta-Counting (TsbC) - a Rapid Method for Measuring Beta-Dose-Rates. *Nuclear Tracks and Radiation Measurements* 14(1-2): 203-207.

Headings:

Run = run number in SUERC beta counting record

File = filename used in SUERC laboratory record

Date = date of measurement

HV = High Voltage setting of the photomultiplier

Threshold = Threshold setting of the counting circuit

Sample = sample name

Mass (g) = mass of sample used for counting

Observed Rolling Average:

Rolling average counts per second observed for Standard (milled shap granite) and Background (empty chamber), including the values measured at the beginning and end of the day the sample was run. Sensitivity (mGy/a/cps) is calculated from these by dividing the infinite matrix beta dose rate of the standard by the difference between count rates from measurements of the standard and background.

Sample counts = photon pulses detected during the measurement sequence (generally six measurements of equal duration)

Time = measurement time for each cycle

Cps = counts divided by time for each sample

Mean gross rate (cps) = arithmetic mean count rate

SD/rtN = Standard deviation divided by the square root of the number of measurement cycles

Poisson error = error predicted from counting statistics

cps (false if value > 3SD different from mean) = filter to remove outliers differing by more than 3 standard deviations from the overall mean: a new mean value is then calculated

Net rate (cps) = filtered gross mean count rate minus rolling average background rate

Beta dose rate (Gy/ka) = net rate times rolling average sensitivity