Pre-dose technique MA

The following protocol “multiple activation pre-dose” follows Aitken (1985).

According to Stoneham (1991) at least **3** slices are necessary for this, in Aitken (1985), Wang (2009) and others it is not stated that several slices are necessary for multiple ß-doses. Consequently, a single dose seems to be sufficient and only a single dose of ß is described. Note : However, it is questionable whether a single slice with a dose of ß is sufficient, since it does not allow for quality control. In this respect, the approach of Stoneham (1991) seems comprehensible and at the same time low measurement and material expenditure, especially for authenticity tests.

This absolutely excludes the possibility that the pre-dose effect dating can be manipulated by any artificial irradiation in order to arrive at an artificially desired created age value measurement!

‘Multiple-activation’ (MA) measurement protocol pre-dose according to Aitken (1985):

Test dose (e. g. 0. 01 Gy) TD ß

2) TL measurement @5°C/s to 150°C immediately after irradiation: → S0 (integral around 110°CPeak) as ‘dose‘ with indication of the test dose

3) Heating to activation temperature @2°C/s and cooling (e. g. 25°C)

4) Test dose (e. g. 0. 01 Gy)

5) TL measurement @5°C/s to 150°C immediately after irradiation: → SN (integral around 110°CPeak) and cooling (e. g. 25°C) as a ‘can’ with indication of the test dose

6) ß-irradiation

7) Heating to 150°C with @2°C/s and cooling (e. g. 25°C)

8) Test dose (e. g. 0. 01 Gy) TD ß

9) TL measurement @5°C/s to 150°C immediately after irradiation: → S‘N (integral around 110°C peak) as ‘bleach+dose‘ with indication of ß-irradiation of 6)

10) Heating to the activation temperature @2°C/s and cooling (eg 25°C)

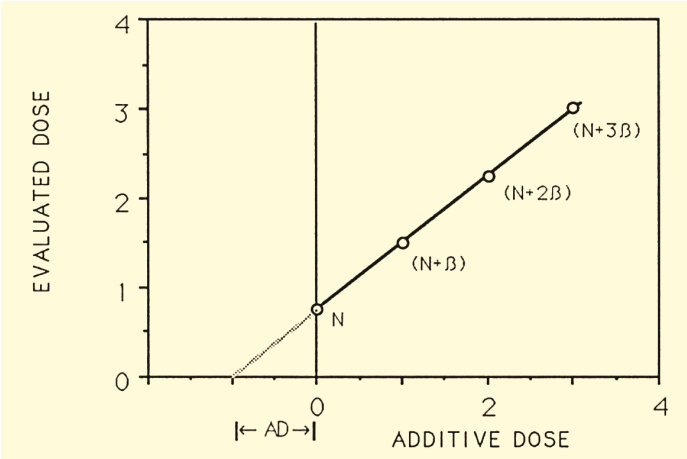
11) Test dose e. g. 0. 01 Gy) TD ß

12 TL measurement @5°C/s to 150°C immediately after irradiation: → SN+ß (integral around 110°C peak) and cooling (e. g. 25°C) as a ‘bleach+dose‘ with an indication of ß-irradiation of 6)

The use of ‘natural+dose’ is used for identification for an automatic analysis of the data. Here, either in the measurement sequence or before the analysis, the status and the applied additive dose (zero for unirradiat) must be entered manually.

Note: highest additive signal should be at least twice the natural
signals).

An apparent paleodose is calculated for each slice (or additive dose group) according to the MA protocol and the paleodose is calculated by
Regression analysis of these results against the previously applied additive dose (Bailiff, 1991):



Regression analysis of the results of the MA results (here evaluated dose) against the additive dose (from Bailiff, 1991) to determine the paleodose

Additive pre-dose technology AM

According to Aitken (1985) in the additive method changes in the pre-dose characteristics and possible influence by thermal 'quenching' is avoided. The thermal activation
The additive pre-dose method was further developed by Bailiff ("modified additive pre-dose" or similar spike method) and now seems to be the most commonly used method also for ceramics and porcelain. Since the measurement effort is only slightly higher, with clear advantages for successful results, only this is described below. In principle, a MA is used for slices with different additive doses.
Temperature recommendations follow here Stoneham (1991), deviating from other authors. Slices receive varyingly increasing additive ß-irradiation (N, N+ß, N+2ß, N+3ß, N+4ß) whereby for natural slices (N=natural) dose = 0. All slices receive a preheat (PH) @5°C/s to 150°C and are measured as follows, whereby both the respective test dose and the beta radiation for all slices must be constant:

Measurement protocol "modified additive pre-dose":

1) Additive ß irradiation (zero for natural 'natural': N, N+ß, N+2ß, N+3ß, N+4ß)
2) Preheat to 150°C with @2°C/s and cooling (e. g. 25°C)
3) Test dose (e. g. 0. 01 Gy)
4) TL measurement @5°C/s to 150°C immediately after irradiation: → S0 (integral around 110°CPeak)
as a 'dose' indicating the test dose
5) Heating to the activation temperature (see Chapter 2) @2°C/s and cooling (e. g. 25°C)
6) Test dose (e. g. 0. 01 Gy) TDß
7) TL measurement @5°C/s to 150°C immediately after irradiation: → SN (integral around 110°CPeak) and cooling (e. g. 25°C) as 'natural+dose' with indication of the additive dose
8) Fixed ß-irradiation (e. g. 1. 0 Gy)
9) Heating to 150°C with @2°C/s and cooling (e. g. 25°C)
10) Test dose (e. g. 0. 01 Gy)
11) TL measurement @5°C/s to 150°C immediately after irradiation: → S'N (integral around 110°C peak) as 'bleach+dose' with indication of ß-irradiation of 6)
12) Heating to activation temperature @2°C/s and cooling (e. g. page 7 of 9
Daniel Richter 25°C)
13) Test dose (e. g. 0. 01 Gy)
14) TL measurement @5°C/s to 150°C immediately after irradiation: → SN+ß (integral around 110°C peak) and cooling (e. g. 25°C) as 'bleach+dose' with the ß-
Irradiation of 6)

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