Supplementary online data of OSL Geochronology Experiments

After HCl wash, the residue was treated with 30% H2O2 (to remove organic debris) and then dry sieved for 90-150 μm or 150-210 μm size fractions. Magnetic and feldspathic grains were then removed using a Frantz magnetic separator. The samples were then etched for 80 minutes in excess 40% HF (to maintain the pH) with continuous stirring followed by a reaction with of 12N HCl for 30 minutes. This ensured conversion of water insoluble fluorides to water soluble chlorides. Etched grains were mounted as a monolayer of 3 mm diameter on stainless steel discs using SilkosprayTM and the purity of these grains vis a vis feldspar contamination was checked by infrared stimulated luminescence. Those contaminated were retched with 10% HF for 10min.

Optical stimulation was by blue-green light stimulation source provided with the Risoe TA-DA-15 reader. The detection optics comprised 2×U-340 and BG-39 filters. Beta irradiation was made using a 25 m Ci 90Sr / 90Y source. The samples were analyzed using NCF- SAR protocol (Singhvi et al., 2011). Typical preheat to 220°C for 10 seconds and the cut heat was 220°C. Depending on the sample yield, about 15 - 40 discs were measured. Typical recycling ratio was 1+/- 0.1, and the dose recovery test reproduced doses to within 10%.

For fine grains, the infrared stimulated luminescence (IRSL) was used. Polyminerallic fine grain (4-11 μm) fraction was extracted after a sequential pretreatment of the samples with HCl (to remove carbonates) and H2O2 (to remove organic carbon). This was followed by deflocculation using 0.01N sodium oxalate solution. The samples were then suspended in an acetone column and the ~ 4-11 μm grain fraction was separated using Stoke’s settling times of 1.5 and 15 min. The separated fraction was re-suspended in acetone and equal volumes were pipetted on to 9.65 mm aluminum discs and dried at ~45°C (Singhvi et al., 2001)*.* The samples were analyzed in an automated Risoe TL-DA-15 system. The detection optics comprised Corning 7-59 and Schott BG-39 filters coupled to an EMI 9635 QA Photomultiplier tube. Beta irradiation was carried out on plate using 25 mCi 90Sr/90Y beta sources and alpha-irradiation was carried out in vacuum using Americium-241 alpha source (Singhvi and Aitken, 1978). Samples were analyzed using IRSL- Single Aliquot Regeneration dose technique with late light subtraction (Aitken, 1998). Preheat plateau was observed between 200°C to 280°C and therefore a preheat of 220°C for 60 seconds and an illumination of 100 seconds was used. Dose recovery test (given verses the recovered dose) gave recovered doses to within 10% of administered doses. Given that signal were feldspar dominated, fading test was done on all fine grain samples. The g values ranged from 3.6 g2days (%/decade) to 7.7g2days (%/decade). The palaeodose (De) values were appropriately corrected for the fading rates (Auclair et al., 2003).

1. Typical optical decay curve of quartz extracted from a) Coastal aeolianite (DD-1) and b) beach Ridge (OD-1), fluvially reworked miliolite (GP-2) (Fig. 1).
2. Typical Growth Curve of few selected samples reconstructed using single aliquot regeneration method for, a) Sample DD-1 from Coastal aeolianite; b), Samples OD-1 from beach ridge and, c) Sample GP-2 from fluvially reworked miliolites, (Fig 2).
3. Preheat plateau, using average of measurements on three discs per preheat temperature. A plateau in De values from 200-280°C was seen and a temperature of 220°C was selected (Fig. 3).
4. Dose Recovery test comprising 5 discs for each sample. These were bleached under an Ultra vitalux Wotan Sun lamp with a window glass in between to reduce the UV flux from it. Measured De's were within 10% of the administered Doses. (Table 1)
5. Typical distribution of paleodoses for a sample each of coastal, aeolian and fluvial environment is given in Fig. 4. Median of error was used for bin width.

Table-1 Dose recovery test data.

|  |  |  |  |
| --- | --- | --- | --- |
| Sample Name | Given Dose (Gy; calibration error 5%) | Dose Recovered (Gy) | Dose recovery ratio |
| MVA-1 | 16 | 15.4±0.4 | 0.96±0.02 |
| ANP-4 | 23.6 | 22.8±0.8 | 0.95±0.03 |
| GP-2 | 17.6 | 16.8±1.6 | 0.95±0.09 |
| KCD-2 | 94.6 | 95.8±2.0 | 1.01±0.02 |
| MG-4 | 36.5 | 37.2±1.5 | 1.02±0.04 |
| RT-1 | 81.8 | 82.4±4.8 | 1.02±0.06 |
| ANP-2 | 55.7 | 55.2±2.2 | 0.99±0.04 |
| MG-8 | 48.5 | 48.6±1.8 | 1.0±0.04 |

Figure 1

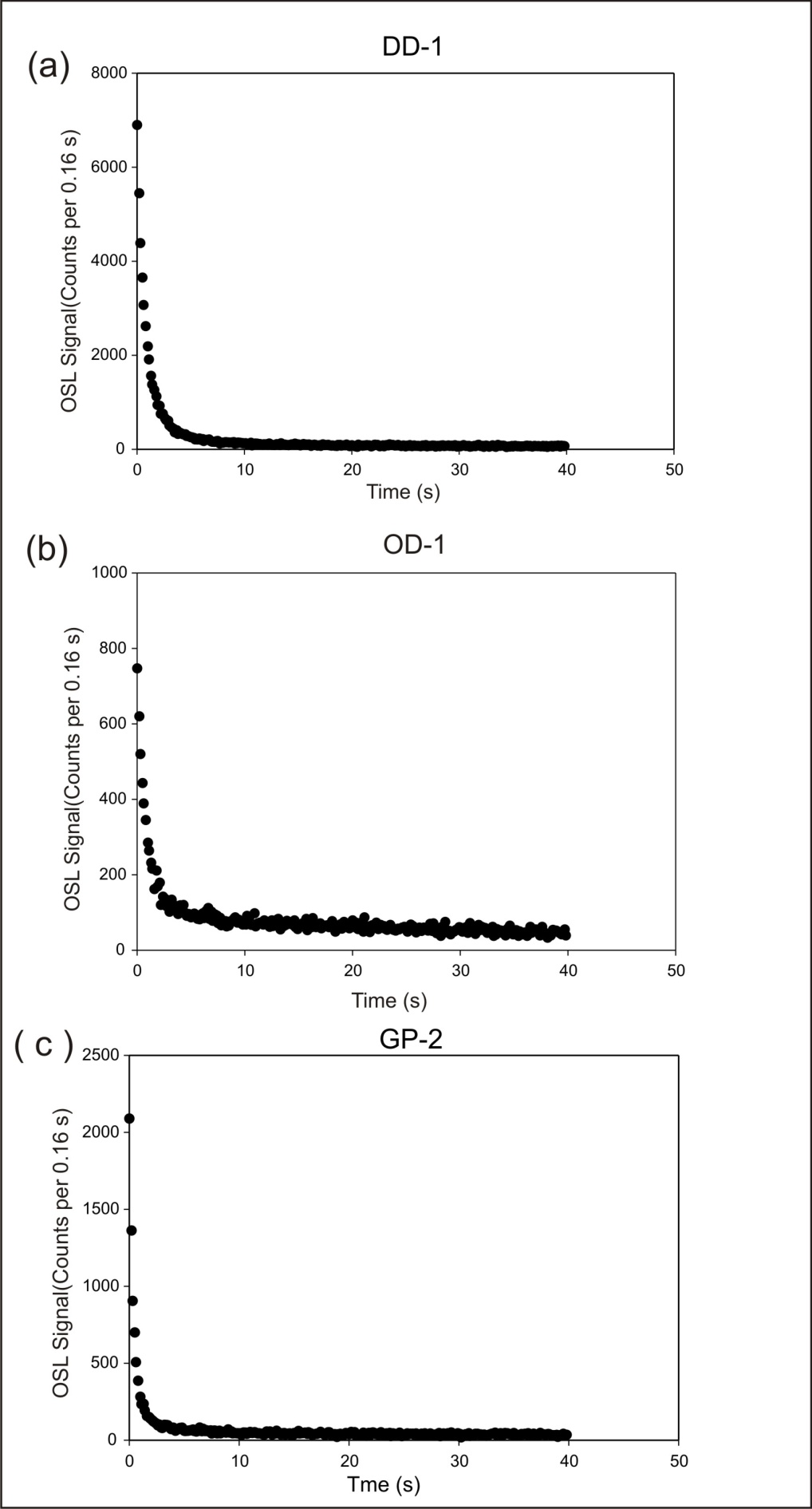


Figure 2

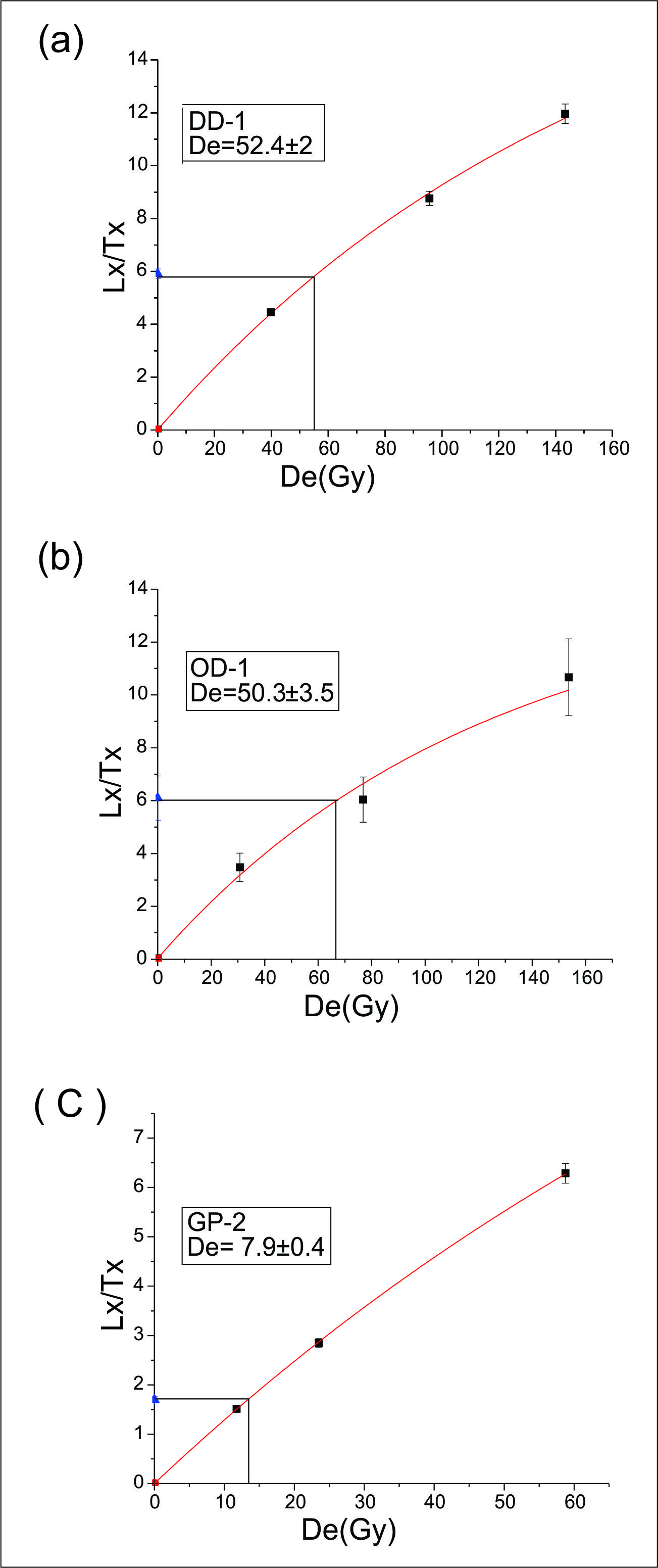


Figure 3

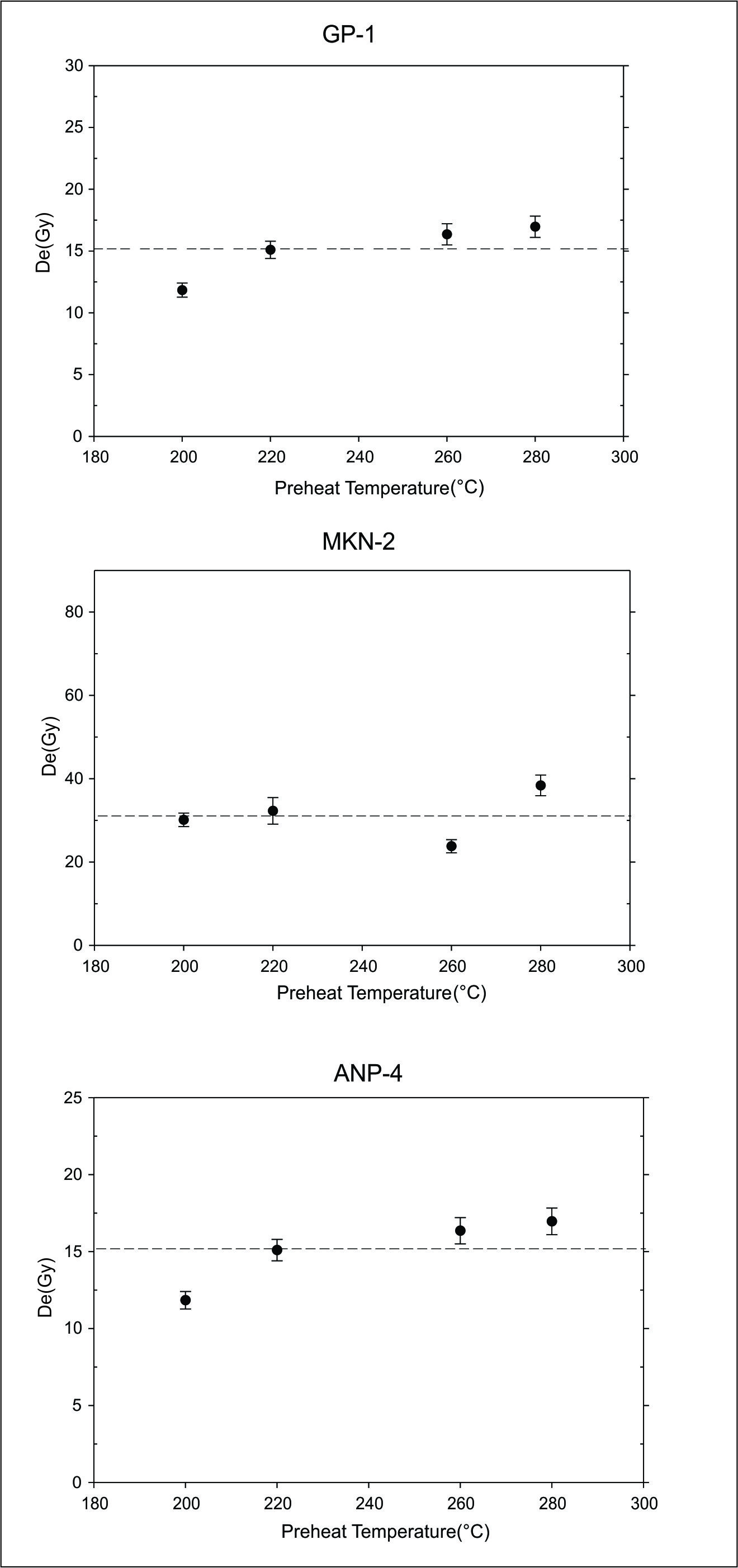


Figure 4

