

Geochemistry (Geochronology)

Comment on *New U–Pb zircon ages from Tonga (Cameroon): coexisting Eburnean–Transamazonian (2.1 Ga) and Pan-African (0.6 Ga) imprints* by E.L. Tanko Njiosseu et al.
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In a recent paper, Tanko Njiosseu et al. [3] presented new U–Pb zircon ages on three rocks from the Tonga region (Cameroon) and discussed their bearing on the evolution of the Pan-African Central African fold Belt north of the Congo craton. The studied rocks include a garnet amphibolite (TG-5), a biotite amphibole gneiss (TG-10) and a synkinematic granitoid (TG-24). The authors concluded that the region is composed of an extensive Palaeoproterozoic crust that underwent a 2.1-Ga granulite facies metamorphism, overprint by the Pan-African event dated at 618 Ma (lower intercept of zircon from TG-5 and synkinematic emplacement of TG-24). Although a Palaeoproterozoic crust reworked during the Pan-African has already been recognized in the African belt, north of the Congo craton [2,4], it is difficult to admit that the conclusion of Tanko Njiosseu et al. [3] was based on their U–Pb analytical results published in their Table 2.

A close examination of the analytical results of Table 2 reveals some strange $^{207}\text{Pb}/^{206}\text{Pb}$ ratios (less than 0.05), which do not fit with the calculated $^{207}\text{Pb}/^{206}\text{Pb}$ ages (e.g., sample TG-24). On the other hand, the atomic ratios presented are corrected for blank, but nothing is indicated for the non-radiogenic lead. Also, they gave 0.06% and 0.16% for the $^{207}\text{Pb}/^{235}\text{U}$ and

$^{206}\text{Pb}/^{238}\text{U}$ error, respectively, but nothing for the $^{207}\text{Pb}/^{206}\text{Pb}$ ratios. Anyway, the given errors are too small and imply an anomalous situation, where the error on $^{207}\text{Pb}/^{235}\text{U}$ is smaller than that on $^{206}\text{Pb}/^{238}\text{U}$.

The published Concordia diagrams also display some strange features indicating inconsistencies between Table 2 and Fig. 4. For example, six fractions were analysed for the sample TG-5, but the corresponding Concordia diagram only shows three plots. Also, the Concordia for TG-10 displays a discordant plot close to 600 Ma, but none of the calculated ages does correspond to this plot.

A comparison of Concordia diagrams derived from their data of Table 2 using the ISOPLOT/EX program [1] also reveals more anomalies on their Concordia diagrams (Fig. 4): in addition to the three missing plots for sample TG-5 (see above), the six fractions for sample TG-5 give a completely different Concordia diagram; the same situation is observed for sample TG-10; diagram for sample TG-24 is correct for the position of the plots, but not for the abscissas, which should be incremented by 0.05. The authors said intercept ages were calculated with all zircon fractions for each sample; but in general, no consistent intercept age can be calculated from our plots, or when this can be done for some selected plots, the resulting age is different from that published by Tanko Njiosseu et al. [3] (e.g., sample TG-24, Fig. 1).

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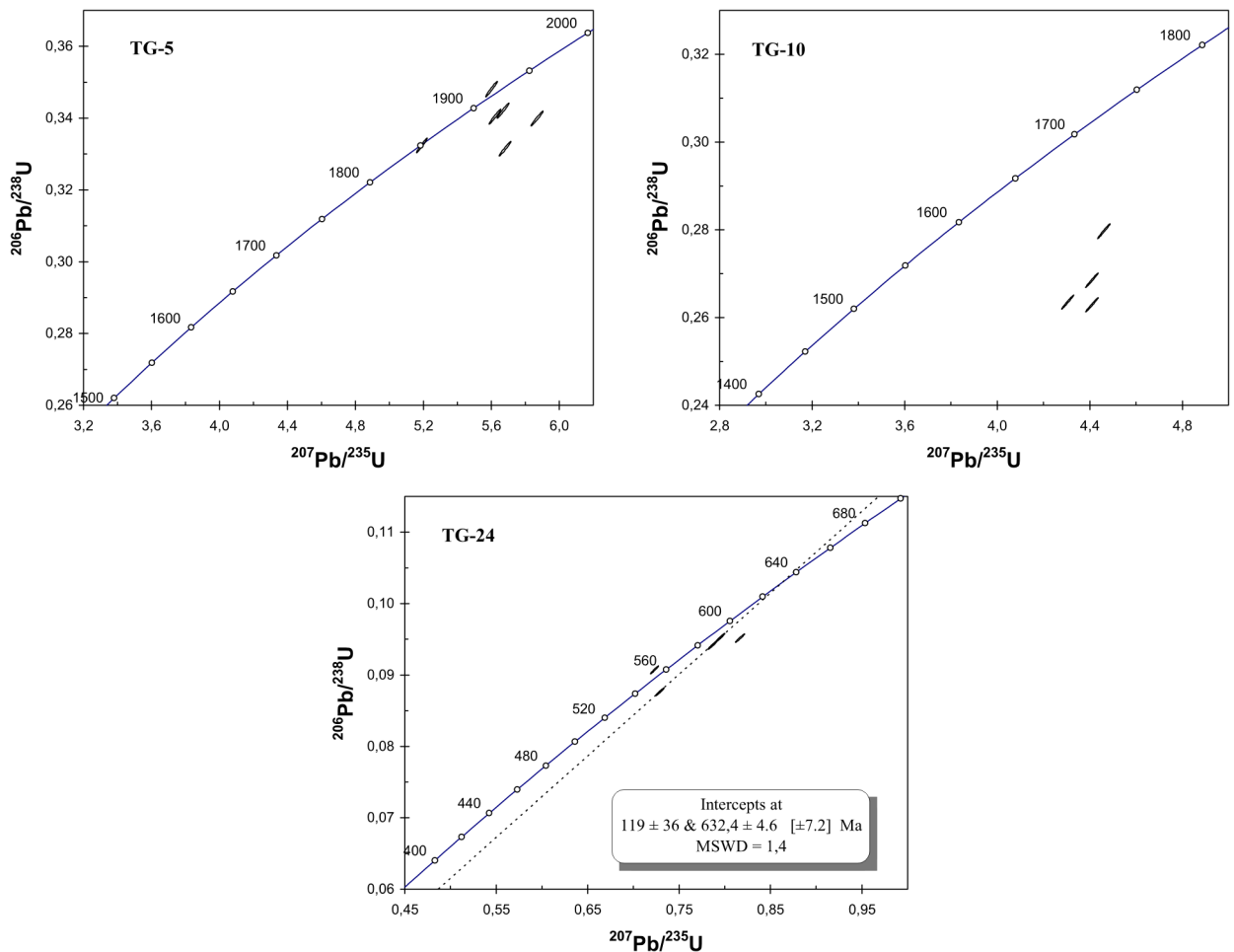


Fig. 1. Concordia diagrams for samples TG-5, TG-10 and TG-24 using data of Table 2 of [3] and 0.5% error for the both $^{207}\text{Pb}/^{235}\text{U}$ and $^{206}\text{Pb}/^{238}\text{U}$; the correlation coefficient used is 0.98.

As we do not know whether the problem concerning these data is related to the atomic ratios or to the calculated ages, it is risky to speculate on the possible interpretations of our Concordia diagrams (Fig. 1). For example, sample TG-5 displays a concordant plot at ca. 1850 Ma (Fig. 1); assuming that the atomic ratios are correct and looking at the position of the other plots, the interpretation proposed by the authors for this sample is not valid.

To interpret the data of Tanko Njiosseu et al. [3] and to understand their bearing on the evolution of the Tonga region (Cameroon), it is important to know how the authors did obtain the age intercepts for the studied rocks and why there is such an inconsistency between atomic ratios and calculated ages. Indeed, there is something very strange with their analytical results and Concordia diagrams, which must be clarified. For now, the conclu-

sions of their study on the Tonga region are not acceptable, as they have no analytical foundation.

References

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