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Zircon U-Pb ages from late Frasnian K-bentonites of Frasnes (Belgium)

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In the Lion quarry near Frasnes-lez-Couvin, a 50 m-thick calcschist sequence is exposed, pertaining to the Late Frasnian, *[Palmatolepis] jamieae* to lower *rhenana* conodont zones. It comprises seven K-bentonite levels, L1 to L7 from bottom to top. L1 and L2 yielded no zircon. L3 to L7 contain euhedral zircon crystals (details in companion abstracts of Lasalle *et al.*, Guillot & Lasalle). The U-Pb geochronology was aimed at bracketing the age of the Frasnian-Famennian boundary.

The available zircon crystals are restricted in size to the range 32–125 μm. Smaller crystals being subject to more severe Pb-loss, dating attempts were performed only on zircon fractions $>$ 60 μm. Conventional datings by isotope dilution – thermally induced mass spectrometry (ID–TIMS) were completed by chemical abrasion (CA–TIMS) attempts at Clermont-Ferrand (JLP).

Discordant U-Pb isotope ratios were found from L4, L5, L7. Only L3 and L6 zircons have yielded concordant, high quality data. For L3, a concordant age of 377.2 $\pm$ 0.5 Ma, based on 10 concordant fractions including several CA-TIMS fractions, was obtained. L6 fractions were of poorer quality. However L6 zircons yielded a concordant age of 370.4 $\pm$ 0.6 Ma based on 4 fractions by CA–TIMS.

A recently published estimation of the Frasnian-Famennian boundary from Kaufmann

et al. (2004, J. Geol.) at 376.1 $\pm$ 1.7, was based on a 377.2 $\pm$ 1.7 Ma result from a K–bentonite of the upper *rhenana* zone. Our best quality results, obtained on L3, are identical within error to their results. However, L3 belongs to a stratigraphically lower conodont zone (lower *rhenana*), so the age determination of Kaufmann *et al.* might be somewhat too old (see also abstracts by Lasalle *et al.* and Guillot & Lasalle).

Validating our CA–TIMS result for L6 at 370.4 $\pm$ 0.6 Ma is less straightforward. It would imply that the lower *rhenana* conodont zone would have lasted more than 5 Ma, surprisingly far from the average $\sim$1 Ma classically considered. It would also imply that the Frasnian-Famennian boundary would be younger than 371 Ma. Obviously, such assertions require supplementary data.