5.0.P15

Timing of mylonitization along the Bavarian Pfahl zone, Bohemian Massif: Implications from U-Pb and Pb-Pb radiometric ages

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The Bavarian Pfahl zone is a major shear zone within the south-western part of the SW Bohemian Massif and represents a tectonic zone of persistent crustal weakness and, as such, provides a window into processes that control crustal reactivation[1,2,3]. To investigate the early period of shear activity, which led to the development of pervasive mylonitic fabrics, zircons from a syn-kinematic feldspar-phyric massive rock (so-called "palite") and cross-cutting dykes were dated by the U-Pb isotope dilution and Pb-evaporation methods. Spatial association of the rocks with the Pfahl zone suggests that the shear zone controlled the siting of these intrusions and that the shear zone was active when the magmas intruded. Both host and dyke rocks are characterised by highly potassic calc-alkaline composition. The palites yield well constrained concordant ages of 334.0 ± 3.0 Ma, 334.5 ± 1.1 Ma (average $^{207}Pb/^{206}Pb$-evaporation zircon ages), 332.7 ± 3.7 Ma (average $^{206}Pb/^{238}U$ age) and 333.1 ± 2.5 Ma (average $^{207}Pb/^{235}U$ age) suggesting a Lower Carboniferous age for the initiation of the Pfahl zone. Complete absence of cores in all investigated zircons indicates that inheritance of older crustal derived zircon has played virtually no role or that the melting temperature was very high. Individual feldspar crystals from a palite sample yield internal Rb-Sr isochron ages of ~300Ma, indicating a long-lasting cooling history after mylonitization. The determination of the dyke emplacement age is complicated by partial Pb-loss in most of the fractions analysed. This Pb-loss can be ascribed to higher U content of the dyke zircons compared to those from the host rock. Upper discordia intercept ages of the different dykes range between 322 ± 5 Ma and 331 ± 9 Ma. The dykes are pre- to synkinematic with respect to penetrative regional mylo-nitization along the Pfahl zone and the upper intercept ages provide a maximum age for this tectonic event.

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5.0.P16

The numerical age of the Devonian-Carboniferous boundary based on U-Pb ages of single zircons

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The age of the Devonian-Carboniferous boundary is only poorly constraint. Based on two SHRIMP zircon ages for the lowermost Carboniferous Claoué-Long et al. [1, 2] estimated an age of 354 Ma for the Devonian-Carboniferous boundary. In contrast, Tucker et al. [3] suggested an age of 362 Ma for the same boundary based on one U-Pb TIMS zircon age for the upper Famennian. In order to resolve this issue, we study six biostratigraphically well fixed airborne volcanic ash layers (Upper Famennian: ω1-3; lower Carboniferous: α1-3) from the auxiliary global stratotype section at Hasselbachtal (Rhenish Slate Mountains/Germany; e.g. [4, 5]. We have analyzed submicrogram-size single zircons and zircon fragments from two, cm thick volcanic ashes in the lower Carboniferous (α1 and α2). The zircons from the tuff layer α1 in the lower Carboniferous *sulcata* conodont zone yield an age of 360.5 ± 1.0 Ma (95%; pooled $^{206}Pb/^{238}U$ ages) and zircons from the younger volcanic ash α2 in the early *duplicata* condont zone yield an age of 358.7 ± 0.7 Ma (95%). A biochronometric time scale of the late Fammenian to early Tournaisian interval is established based on all recently published U-Pb ID-TIMS ages (zircons, monazites). The age of the Devonian-Carboniferous boundary can be estimated by interpolation to 359.9 ± 0.1 Ma. Future refinements of the age of this boundary may depend on the dating of the other four volcanic ashes (ω1-3 and α3), and this highlights the value of defining biostratigraphic stratotypes in the vicinity of known dateable horizons.

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