Electronic Supplementary material 1

Analytical techniques

1. *Whole-rock chemistry*

About 15 kg of fresh material per sample was collected from 14 localities covering the whole area of the Žulová Pluton. After crushing and splitting, samples were milled in agate mortar in order to obtain a ~100–200 g of representative whole-rock aliquot.

Whole-rock major-element analyses were carried out in the Central Laboratory of the Czech Geological Survey, Prague. Further analytical details of wet chemistry procedures were given in Dempírová (2010); the relative 2σ uncertainties were better than 1 % (SiO_2), 2 % (FeO), 5 % (Al_2O_3, K_2O and Na_2O), 7 % (TiO_2, MnO, CaO), 6 % (MgO) and 10 % (Fe_2O_3, P_2O_5).

Selected trace-element abundances (Ba, Sr, Zr, Y, Ni, Co, Zn, Cr and V) were analyzed by ICP-AES while other trace-element measurements were performed by ICP-MS, following an alkaline fusion and subsequent dissolution in HNO_3 at the LHyGeS Laboratory, Strasbourg. The relative 2σ uncertainties, based on duplicates and long-term analyses of an international basalt standard (BE-N), were better than 5 % and 10 % for minor and trace elements, respectively. Geochemical data were explored and plotted by the *GCDkit* package (Janoušek et al. 2006).

2. *Radiogenic isotopes*

The Sr–Nd analytical procedures were performed at the Czech Geological Survey, Prague (CGS). Samples were dissolved using a combined HF–HCl–HNO_3 digestion. Strontium and REE were isolated from the bulk matrix by following the ion-exchange chromatography techniques of Pin et al. (1994) (PP columns filled with Sr.spec and TRU.spec Eichrom resins for separation of Sr and bulk REE, respectively). The Nd was further separated from the REE fraction on PP columns with Ln.spec Eichrom resin (Pin and Zalduegui 1997). Further analytical details were reported by Míková and Denková (2007).

Isotopic analyses were performed on a Thermo Finnigan Neptune multi-collector inductively coupled plasma mass spectrometer (MC ICP-MS) at CGS. The measured Sr isotopic ratios were corrected for mass-dependent instrumental fractionation using exponential law and assuming $^{86}Sr/^{88}Sr = 0.1194$ (Steiger and Jäger 1977). The minor isobaric interference of Rb on mass 87, if present, was corrected assuming $^{87}Rb/^{85}Rb = 0.3857$ (Steiger and Jäger 1977). Reproducibility of the isotopic determination is estimated form replicate analyses of the NIST NBS 987 reference material during the analytical session, with an average $^{86}Sr/^{88}Sr = 0.710338 \pm 10$ (2σ; n = 8).

The measured $^{143}Nd/^{144}Nd$ ratios were corrected for mass-dependent instrumental fractionation using exponential law to $^{146}Nd/^{144}Nd = 0.7219$ (Wasserburg et al. 1981). If present, the isobaric interference of Sm on mass 147 was corrected assuming natural isotopic ratio of $^{144}Sm/^{147}Sm = 0.20648$. During the analytical session replicate analyses of JNdi-1 Nd reference material (Tanaka et al. 2000) yielded the average $^{143}Nd/^{144}Nd = 0.512114 \pm 12$ (2σ; n = 8).

Rubidium, Sm and Nd concentrations were measured by ICP-MS, Sr concentrations by ICP-AES. The Sr and Nd decay constants are from Steiger and Jäger (1977) and Lugmair and Marti (1978), respectively. The initial ε_{Nd} values and single-stage CHUR Nd model ages were obtained using the Bulk Earth parameters of Jacobsen and Wasserburg (1980); the two-stage Depleted Mantle Nd model ages were calculated after Liew and Hofmann (1988). The isotopic data were evaluated by the *GCDkit* ('SrNd.r' plugin).

3. *Zircon dating*

For zircon separation, about 15 kg of coarsely crushed rock per sample were sieved. The resulting *c.* 1.5 kg were further divided into three granulometric fractions of 315–250 μm, 250–100 μm and 100–50 μm. Heavy fractions were then carefully separated with a pan followed by the removal of a magnetic fraction with a hand magnet. Approximately 20 to 70 zircons per sample were hand-picked in ethyl alcohol under binocular and selected for CL imaging.

Zircon grains were mapped with CL technique using a TESCAN Vega electron microscope, housed at the Institute of Petrology and Structural Geology, Charles University, Prague. Typical operating conditions were 20 kV and 10 nA.

Dating was carried out at the University of Lausanne (Switzerland) with an Element XR sector-field ICP-MS (Thermo-Scientific) coupled to an UP-193FX laser ablation system (New Wave Research). The laser was fired at a repetition rate of 20 Hz at the energy density of *c.* 5.0 J.cm^{-2}. The diameter of the laser beam was typically 30 μm. Data acquisition consisted of 35 s blank measurement followed by collection of the U and Pb signals from the ablated zircons for 30 s. Zircon reference material GJ-1 (608.5 Ma; Jackson et al. 2004) was used as an internal standard for instrumental bias calibration. Zircon reference material 91500 (1065 Ma; Wiedenbeck et al. 1995) was analyzed periodically as an unknown sample to cross-check the calibration. Raw data were processed offline using a Lamtrace spreadsheet (Jackson 2008) following the ratio-of-the-mean intensities method (Ulianov et al. 2012). The raw intensities versus time data were monitored to check for abrupt zonation and outlier rejection was undertaken by averaging the two bracketing values, when intensity spikes outside of two standard deviation of the mean value were observed. No common-lead correction was applied but a qualitative control of intensities acquired on masses 201 and 204 associated with low $^{206}Pb/^{204}Pb$ ratio led to rejection of 3 out of 17 spots in the sample ZU-3. During all analytical series the replicate analyses of 91500 reference zircon were within ±1.4% of the $^{206}Pb/^{238}U$ age obtained by Wiedenbeck et al. (1995). Accordingly, a systematic error of 1.5% (2σ) was propagated to pooled ages calculated with Isoplot/Ex v.3.75 (Ludwig 2008). The U–Pb isotopic ratios of unknown samples, paralleled by data from the reference zircons, are reported in *Supplementary Tab. 3*.

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