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The Upper Cretaceous section at Schmilka in Saxony (Elbsandsteingebirge, Germany) – syntectonic sedimentation and inverted zircon age populations revealed by LA-ICP-MS U/Pb data

Das Oberkreide-Profil bei Schmilka in Sachsen (Elbsandsteingebirge, Deutschland) – syntektonische Sedimentation und inverse Zirkon-Alterspopulationen offengelegt durch LA-ICP-MS U/Pb-Daten

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Abstract

Mesozoic sediments in Saxony are represented by few limited occurrences of Lower Triassic and Middle to Upper Jurassic deposits but mainly by Upper Cretaceous predominantly clastic units filling the Elbe Zone (Pietzsch 1963, Voigt & Tröger in Niebuhr et al. 2007, Tröger in Pälchen & Walter 2008). The latter ones are confined by the Lausitz Block (part of the West-Sudetic Island) in the NE and the Erzgebirge (part of the Mid-European island) in the SW. The Upper Cretaceous sedimentation in the area of the Elbsandsteingebirge starts with the Upper Cenomanian marine transgression. Sediments of the Elbsandsteingebirge were deposited in marine environment in a narrow strait connecting northern cold Boreal water of N – NW Europe with the Tethyan warm-water areas in the S. The West-Sudetic Island (Lausitz-Krkonosze High) was the most possible source area for the Upper Cretaceous sediments of the Elbe Zone (Voigt 1994, Wilmsen 2011). Composition of sandstones and conglomerates indicate erosion and redeposition of older sediments which covered initially the basement of the Lausitz.

We analysed six samples representing a 400 m thick sandstone succession (Schmilka, Postelwitz and Schrammstein formations) of Early Turonian to Early Coniacian age from the area around Schmilka (Elbsandsteingebirge) regarding their U/Pb-ages of detrital zircon grains. A significant change in the age spectra occurs from the Upper Turonian to the Lower Coniacian. We found a sudden input of Meso- and Palaeoproterozoic ages in the uppermost part of the Schmilka section that represent typical Baltica ages. As the whole region of northern Germany was covered by marine Cretaceous sediments, a direct input from Baltica (Scandinavia?) is impossible. Facies distribution and recent investigations suggest that during Middle Jurassic a major part of sandstones derived from uplifted parts of Paleoproterozoic and Mesoproterozoic units of Baltica. Therefore, we interpret the presented Coniacian age spectra as a signal of redeposited Middle Jurassic sandstones. Erosion of Jurassic sediments started not earlier than Early Coniacian (higher Schrammstein Formation, Sandstone e).
The limited amount of ca. 540 Ma ages and predominance of variscan ages in all samples confirm covering of the Cadomian basement units of the Lausitz Block by Mesozoic sediments, originally derived from the Bohemian massif during the first depositional cycle. The basement rocks of the Lausitz Block were not available for erosion until at least Middle to Late Coniacian time.

Further, our data confirm the inversion of the Lausitz Block relative to the Elbe Zone during Late Cretaceous time as already proposed by Voigt (1994).

Kurzfassung

Mesozoische Sedimente sind in Sachsen durch wenige vereinzelte Vorkommen der unteren Trias und des mittleren bis oberen Jura in der Umrandung des Lausitzer Massivs vertreten. Den Hauptanteil bilden aber die oberkretazischen vorwiegend klastischen Einheiten, welche in der Elbtal-Gruppe zusammengefasst sind und das Elbtal ausfüllen (Pietzsch 1963, Voigt & Tröger in Niebuhr et al. 2007, Tröger in Pälchen & Walter 2008). Diese werden im NE durch den Lausitz-Block (als Teil der Westsudetische Insel) und im SW durch das Erzgebirge (als Teil der Mitteleuropäischen Insel) begrenzt. Die oberkretazische Sedimentation im Elbsandsteingebirge beginnt mit der obercenomanen Transgression. Die hier diskutierten Sandsteine wurden in einem engen Meeresarm abgelagert, welcher das kältere boreale Nordmeer mit der südlichen wärmeren Tethys verband (Wilmsen et al. 2011). Die Westsudetische Insel (Lausitz-Riesengebirge Block) stellt das Hauptliefergebiet für die oberkretazischen Sedimente der Elbezone dar (Voigt 1994, Wilmsen 2011). Die Zusammensetzung der Sandsteine und Konglomerate legt nahe, dass der Lausitz-Block als ein Teil der Westsudetischen Insel mit Sedimenten bedeckt war, welche während der Oberkreide erodiert wurden.

Wir analysierten sechs Sandsteinproben aus dem Gebiet um Schmilka (Elbsandsteingebirge) hinsichtlich ihrer U/Pb-Alter detritischer Zirkone. Die etwa 400 m mächtige Abfolge (Schmilka-, Postelwitz- und Schrammstein-Formation) repräsentiert das Untere Turon bis Untere Coniac. Es gibt eine auffällige Veränderung der Altersspektren vom späten Turon bis ins frühe Coniac. Wir fanden einen plötzlichen Eintrag meso- und paläoproterozoischer Alter im obersten Niveau der Schmilka-Sandsteinabfolge. Diese Alter sind typisch für eine Baltika-Herkunft. Da aber ganz Norddeutschland während der Oberkreide von Meer bedeckt war, ist eine direkte Lieferung von Baltica (Skandinavien) ausgeschlossen. Die Faziesverteilung und neueste Provenienzstudien indizieren, dass während des Mittleren Jura ein großer Teil der Sandsteine aus gehobenen Einheiten Baltikas herzuleiten ist. Deshalb interpretieren wir das Altersspektrum als Wiederaufarbeitung jurassischer Sandsteine. Die Erosion dieser Jura-Sedimente auf dem Lausitz-Block begann erst im Unterconiac (höhere Schrammstein-Formation, Sandstein e). Die geringen Mengen an 540 Ma alten Zirkonen in allen Proben und die Vorherrschaft von variszischen Altern, die für das Böhmische Massiv typisch sind, bestätigen, dass das cadomische Grundgebirge des Lausitz-Blocks von Sedimenten bedeckt war, die im ersten Ablagerungszyklus vom Böhmischen Massiv geliefert wurden. Die Grundgebirgseinheiten standen nicht vor dem unteren Coniac (vermutlich erst später) an der Oberfläche an.

Die Untersuchungen bestätigen die Inversion des Lausitzer Massivs in der späten Oberkreide (Voigt 1994).

1. Introduction and geological setting

Apart from some scattered occurrences of Lower Triassic in some shallow synclines and Zechstein to Upper Jurassic at the margins of the Lausitz Block, Upper Cretaceous sediments represent the major part of Mesozoic deposits in Saxony. They are mainly restricted to the Elbe Zone and represent the subsidence axis of the extended Bohemian Cretaceous basin which covers the Bohemian Massif in the Czech Republik. In the Elbsandsteingebirge sediments range from the Middle Cenomanian to the Lower Coniacian and were summarized as Elbtal Group. Thickness and facies distribution indicate syntectonic deposition in the front of an uplifting source area (Pietzsch 1963, Voigt 1994, Tröger in Pälchen & Walter 2008).

1.1. Mesozoic sedimentation in Saxony

Jurassic and Triassic sediments are only known from very few localities, but these scattered remnants support the assumption that there had been a Triassic as well as a Jurassic cover on the pre-Mesozoic basement of Saxony (e.g. Tröger in Pälchen & Walter 2008). Triassic sediments show the same characteristics as the very uniform basin-fill of the Triassic Germanic Basin. The lower Triassic time is characterized by continental red beds (Buntsandstein). Sediments are only known from drill holes in northeastern Saxony (Spremberg-Weißwasser, Lausitz Block) and from some occurrences in western (Zeitz-Schmölln Syncline) and northern (Mügeln and Düben-Mühlberg Syncline) Saxony (Pietzsch 1963, Friebe in Pälchen & Walter 2008). Additionally, Lower Triassic sandstones of limited thickness are exposed in the central part of the Elbezone around Meißen.

Jurassic sediments in Saxony are even rarer than the Triassic ones and only known from some occurrences along the Lausitz Thrust (Tröger in Pälchen & Walter 2008), where they underlie Upper Cretaceous deposits and got incorporated into the partly overturned sediments along the thrust (Fig. 1).

Sedimentation started in the Middle to Late Jurassic, as at this time the marine transgression reached the area of today's Saxony. A general fining trend is observed in the sedimentary record, forming a succession that grades from sand- into silt- and limestones (according to Cotta 1838 in Pietzsch 1963: 360). Earlier investigations proposed a narrow sea strait in the Elbezone but pelagic limestones and marls point to an extended shallow basin at least during Late Jurassic.

The Late Jurassic to Early Cretaceous time is characterized by widespread and extensive erosion. This lead to general subsidence and is assumed to explain the transgression of Cenomanian deposits on the metamorphic basement of the Erzgebirge and the Elbe Zone (Tröger in Pälchen & Walter 2008). A first transgression happened during the Early Cenomanian (Meißen Formation), but did not reach the area of the Elbsandsteingebirge. After a fluvial phase a new transgression during the Late Cenomanian strongly influenced the whole area including all sediments of the Elbe Zone (Voigt & Tröger in Niebuhr et al. 2007). Therefore, sediment accumulation and subsidence in the Elbezone started not before Cenomanian.

The Upper Cretaceous sediments in the surroundings of the Lausitz Block are mainly restricted to the northern margin of the Lausitz and the Elbe Zone but covered also the eastern Erzgebirge (Tröger in Pälchen & Walter 2008). The Meißen Formation (marine) contains the oldest sediments of the Elbtal Group. The fluvial deposits of the Niederschöna Formation represent the chronological next unit, which is followed again by marine sediments due to the Middle to Late Cenomanian transgression. During this second transgression the sandstones of the Elbsandsteingebirge where deposited (Oberhäslich, Schmilka, Postelwitz, and Schrammstein formations). Sedimentation continued at least until the Santonian in the Bohemian Cretaceous, but these youngest deposits were not preserved in Saxony.

Sedimentation occurred in a narrow sea strait connecting the cold Boreal of N–NW Europe with the warm Tethyan areas in the S. This strait was confined by the Mid-European Island comprising the Bohemian Massif in the SW and the West-Sudetic Island including the Lausitz Block in the NE (Tröger 1964, Wilmsen et al. 2011). Therefore, the Erzgebirge (Bohemian Massif, part of the Mid-European Island) and the Lausitz Block (part of the West-Sudetic Island) are likely source areas for the Cretaceous sediments in Saxony. Due to tectonic activity and the development of the Lausitz Thrust, the area between these two islands evolved as an asymmetric basin (marginal trough) deepening towards the Lausitz Block (Voigt 1994). Thickness maps of the Upper Cenomanian sediments show first evidence of differential subsidence due to the tectonic activity. From Turonian time onwards, the sedimentation was clearly syn-tectonically controlled by the relative uplift of the Lausitz Block and enhanced subsidence in an axis running parallel to the recent Lausitz thrust (Voigt 1994).

From the NW to the SE, the Saxon Cretaceous sediments become more and more siliciclastic, changing from hemipelagic limestones and marly dominated units around Meißen and Dresden (NW) to massive sandstones in the Elbsandsteingebirge (SE).

The Schmilka-Großer Winterberg section (Elbsandsteingebirge, for location see Fig. 2) represents the thickest undisturbed succession, ranging from the Lower Turonian Schmilka-Formation to the Upper-Turonian/Lower Coniacian Schrammstein-Formation. The total thickness of the Upper Cretaceous in Saxony is in the order of 550 to 650 m (Tröger in Pälchen & Walter 2008) in the Elbsandsteingebirge and possibly 1000 m in the Zittauer Gebirge, where the Lower Coniacian is represented by thick sandstones of the Waltersdorf Formation. Further towards the SE, the sandstones pass over into the Upper Cretaceous of the Bohemian Basin (Czech Republic).

1.2. Schmilka section

The Schmilka – Großer Winterberg section is mainly characterised by thick marine sandstone packages comprising a complete 400 m thick succession of the Lower to Middle Turonian Schmilka Formation, the Middle to Upper Turonian Postelwitz-Formation and the Upper Turonian to Lower Coniacian Schrammstein Formation. The *labiatus* Sandstone marks the base of the section (Schmilka Formation). The overlying Postelwitz- and Schrammstein formations can be further subdivided in distinct units which have member status: Sandstones a, b and c according to Lamprecht 1928, 1931 and 1934 are summarized as Postelwitz Formation (Prescher 1981), d and e as Schrammstein Formation (Voigt & Tröger 2007) at the top of the Großer Winterberg (Fig. 2 and 3).

2. Samples and methods

2.1. Samples

The completely exposed Schmilka – Großer Winterberg section forms the type locality of the lithostratigraphic subdivision of the Cretaceous in the Elbsandsteingebirge. Sampling covered the whole succession within a vertical distance of about 30 to 70 meters between the sample points. These samples represent all Upper Cretaceous sandstone units from the Schmilka-, Postelwitz-, and the Schrammstein formations (see Fig. 3). The sediments are represented by fine- to coarse grained quartz sandstones with a relatively low content of feldspar in the Schmilka Formation and the Sandstones b and d, respectively; and a higher amount of feldspar in the Sandstone a and e. Heavy mineral spectra are mainly dominated by tourmaline, zircon, and rutile. In total six sandstone samples were analysed regarding their zircon U/Pb ages. The sample localities for the sandstones used for zircon dating are marked in figures 2 and 3. Sample coordinates are given in table 1.

2.2. Methods

Zircon concentrates were separated from 1–3 kg sample material at the Senckenberg Naturhistorische Sammlungen Dresden. After crushing the rocks in a jaw crusher, the material was sieved and washed. The heavy mineral separation was realized by using heavy liquid LST (sodium heteropolytungstates in water) and a Frantz magnetic separator. Final selection of the zircon grains for U/Pb

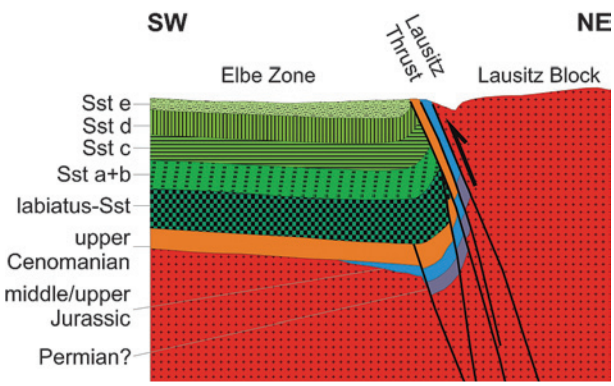

Fig. 1. The cross-section of the Saxonian Cretaceous Basin shows the thrusting of the Lausitz Block on the Mesozoic deposits (based on Lobst 1993). The sediments are overthrusted. Important are the Jurassic deposits that are preserved along the fault. They are in general absent below the Cretaceous deposits elsewhere in Saxony. Their occurrence and facies indicate a widespread Jurassic cover and the inversion of a Jurassic-Early Cretaceous graben which was established in the area of the recent Lausitz Block.

Abb. 1. Schnitt durch das sächsische Kreidebecken, der deutlich die Aufschiebung des Lausitz-Blocks auf die mesozoischen Sedimente des Elbtals zeigt. Die Sedimentschichten wurden dabei überkippt. Wichtig ist das Vorkommen jurassischer Sedimente im Liegenden der kreidezeitlichen Ablagerungen. Sie sind nur im Störungsvolumen erhalten geblieben und fehlen im Untergrund des Sächsischen Kreidebeckens. Ihre Existenz und ihre Ausbildung lassen auf eine ehemals weite Verbreitung jurassischer Sedimente und die Inversion eines Grabens schließen, der ursprünglich auf dem Lausitzer Massiv angelegt und in der Oberkreide invertiert wurde.

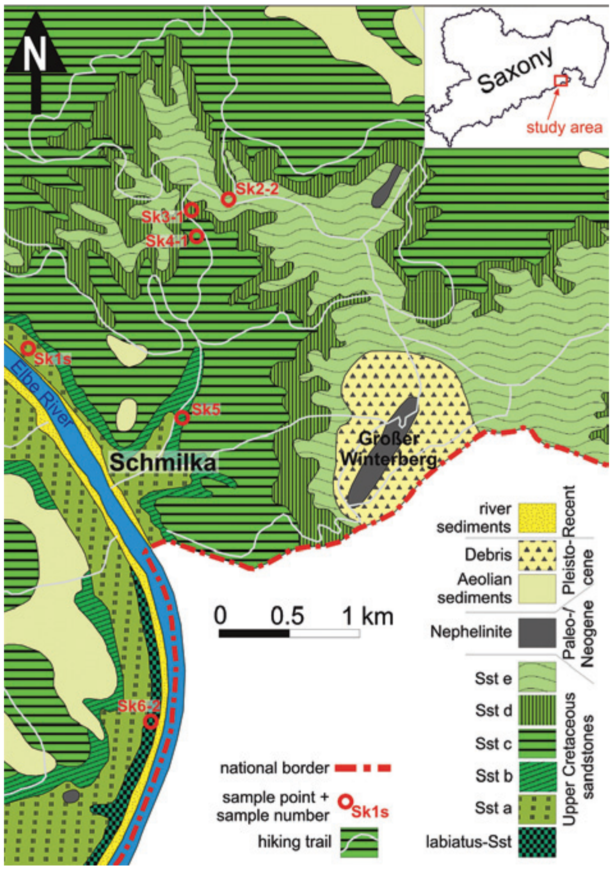

Fig. 2. Geological map of the study area (slightly modified from Lobst, 1993) showing the Upper Cretaceous sandstones that represent the Schmilka (*labiatus* Sandstone), the Postelwitz (Sandstones a – c) and the Schrammstein formations (Sandstones d and e). Sample points are indicated.

Abb. 2. Die geologische Karte des Untersuchungsgebietes (leicht verändert nach Lobst 1993) zeigt die oberkretazischen Sandsteine der Schmilka- (*labiatus*-Sandstein), der Postelwitz- (Sandsteine a – c) und der Schrammstein-Formation (Sandsteine d und e). Die Probenahmepunkte sind eingetragen.

dating was achieved by hand-picking under a binocular microscope. Zircon grains of all grain sizes and morphological types were selected, mounted in resin blocks and polished to half their thickness. The zircon grains where examined regarding their cathodoluminescence signal using an EVO 50 Zeiss Scanning Electron Microscope (Senckenberg Naturhistorische Sammlungen Dresden) prior to U/Pb analyses. This helps to distinguish different growth and maybe metamorphic zones within the single grains. For U/Pb analyses the laser spots where placed in zones with monophase growth patterns that show no metamorphic overprint. Zircons were analyzed for U, Th, and Pb isotopes by LA-SF ICP-MS techniques at the Senckenberg Naturhistorische Sammlungen Dresden (Museum für Mineralogie und Geologie, GeoPlasma Lab), using a Thermo-Scientific Element 2 XR sector field ICP-MS coupled to a New Wave UP-193 Excimer Laser System. A teardrop-shaped, low volume laser cell constructed by Ben Jähne (Dresden, Germany) and Axel Gerdes (Frankfurt am Main, Germany) was used to enable sequential sampling of heterogeneous grains (e.g. growth zones) during time resolved data acquisition. Each analysis consisted of 15 s background acquisition followed by 20 s data acquisition, using a laser spot-size of 20 to 25 µm, respectively. The signal was tuned for maximum sensitivity for ^{206}Pb and ^{238}U. A common-Pb correction based on the interference- and background-corrected ^{204}Pb signal and a model Pb composition (Stacey & Kramers 1975) was carried out if necessary. The necessity of the correction is judged on whether the corrected ^{207}Pb/^{206}Pb lies outside of the internal errors of the measured ratios. Discordant analyses were always interpreted with care and discarded. The interference of ^{204}Hg on mass 204 (Pb) was calculated by using a ^{204}Hg/^{202}Hg ratio of 0.2299 and measured ^{202}Hg. Raw data were corrected for background signal, common Pb, laser induced elemental fractionation, instrumental mass discrimination, and time-dependant elemental fractionation of Pb/Th and Pb/U using an Excel® spreadsheet program developed by Axel Gerdes (Frankfurt am Main, Germany). Reported uncertainties were propagated by quadratic addition of the external reproducibility obtained from the standard zircon GJ-1 (~0.6% and 0.5 – 1% for the ^{207}Pb/^{206}Pb and ^{206}Pb/^{238}U, respectively) during individual analytical sessions and the within-run precision of each analysis. Isoplot diagrams (1 σ error) were produced using AgeDisplay (Sircombe 2004). The ^{207}Pb/^{206}Pb age was taken for interpretation for all zircons >1.0 Ga, and the $^{206}Pb/^{238}U$ ages for younger grains. For further details on analytical protocol and data processing see Gerdes & Zeh (2006) and Frei & Gerdes (2009).

3. Results

The U/Pb zircon ages show very similar results for the first five samples (Sk 6-2, Sk 1s, Sk 5, Sk 4-1, 3-1) representing the sandstone units *labiatus* Sandstone (Schmilka Formation), Sandstone a, b, c (Postelwitz Formation), and Sandstone d (Schrammstein Formation) (Fig. 3). The youngest concordant measurement for each sample is given in the AgeDisplay diagrams in Figure 3. For all samples, the age spectra start at ca. 300 to 330 Ma and go on more or less continuously until ca. 800 Ma. The youngest single zircon grain was found in sample Sk 5, giving an age of 258 ± 6 Ma (2 σ error). There are abundant (for samples Sk 6-2, Sk 1s, Sk 5, Sk 4-1, Sk 3-1) or many (sample Sk 2-2) Meso- and Palaeoproterozoic zircon ages up to ca. 2000 to 2100 Ma. Archean ages were only found in the base of the section in sample Sk 6-2 (*labiatus* Sandstone, Schmilka Formation), represented by one zircon grain with an age of 2969 ± 76 Ma (2 σ error). There is only one more grain older than 2100 Ma found in sample Sk 4-1 (Sandstone c, Postelwitz Formation) giving an age of 2441 ± 34 Ma (2 σ error, Fig. 3).

The most important result is the striking difference in abundance and distribution of age spectra of the Meso- and Palaeoproterozoic zircon in sample Sk 2-2 (Sandstone e, Schrammstein Formation) compared to all other samples. The increasing number of Proterozoic ages in the upper part of the section is associated with a decrease in Palaeozoic ages (Figs. 3 and 4).

4. Interpretation and discussion

The recent geology of the Lausitz Block is dominated by early Cambrian granodiorites which intruded Late Neoproterozoic greywackes. The age spectra of these units are well known and represent the following ages: The sedimentation age of the greywackes is assumed to be ca. 570 Ma, given by youngest detrital zircon grains and ash layers. In addition to this, the greywackes contain few detrital zircon grains of Archean ages (up to 3.5 Ga) and abundant zircons of Palaeo- and Neoproterozoic/Cadomian ages. Important is the lack of detrital Mesoproterozoic zircon grains in these sediments. The intruding granodiorites are summarized as Lausitz Granodiorite Suite and show zircon ages of ca. 540 Ma. Only the Rumburg Granite with ca. 490 Ma is younger. On top of these Cadomian units lie Lower Ordovician shallow marine sediments represented by the Dubrau Formation (Tremadoc, ca. 480 Ma; Linnemann 2008, Linnemann et al. 2011).

The ages are different from observed ages of the Cretaceous sandstones in the Schmilka-Großer Winterberg section. We did not find a prominent peak of ca. 540 Ma old zircon grains, as expected due to the direct neighbourhood to the 540 Ma old granodiorites of the Lausitz Block. Ages of this time were found in all samples, but not with increased amounts relatively to other age groups. Nevertheless, this age group occurs both in the Variscan deformed basement of the Bohemian Massif as well as in the units of the Lausitz Block. Therefore, we conclude that these sandstones were derived from sedimentary units which covered the inverted Lausitz Block during the Cretaceous and were originally derived from the Bohemian Massif.

We interpret the Neoproterozoic to Paleozoic ages of all samples as the influx of reworked units of the Avalonian/Armorican and Variscan basement units (Hofmann et al. 2009). The youngest concordant U/Pb zircon age of 258 ± 6 Ma (sample Sk 1s, sandstone a, Fig. 3) shows that there had been magmatic activity in the uppermost Permian, maybe representing the first break-up activities of Pangea and opening of Permian basins.

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Zircons of Triassic, Jurassic and Cretaceous sandstones in Germany indicate a distinct change in source area of the Jurassic sediments compared to Triassic and Cretaceous sediments. Middle Jurassic sandstones (Dogger) show a distinct age peak in the Meso- and Paleoproterozoic ages (Hofmann et al. 2009). These ages are representative for a Baltica provenance (Hofmann et al. 2009) and correlate to the regional uplift of the North Sea Dome during the Middle Jurassic which resulted in the widespread erosion and resedimentation of Early Jurassic and Triassic sandstones of the Northsea Basin which were originally shed from the Baltic shield.

There is no potential source area providing big amounts of zircon ages between 900 and 1900 Ma in Central Europe. Therefore it is likely, that the high amount of Proterozoic ages in the uppermost sample (Sk 2-2, Sandstone e, see Fig. 4) derived from eroded and reworked Jurassic siliciclastic sediments covering the Lausitz Block at that time. The samples Sk 6-2 to Sk 3-1 were taken below Sk 2-2 (Fig. 3) and do not show this massive input of Proterozoic ages. They prove that Middle Jurassic deposits where not at the surface at that time. Probably, they had still been covered by younger sediments (Upper Jurassic to Lower Cretaceous). The erosion of units with the Meso-/Proterozoic age spectra started in the Coniacian. Therefore the basement units of the Lausitz Block were not at the surface and not available to erosion during Turonian – Coniacian time (Fig. 5).

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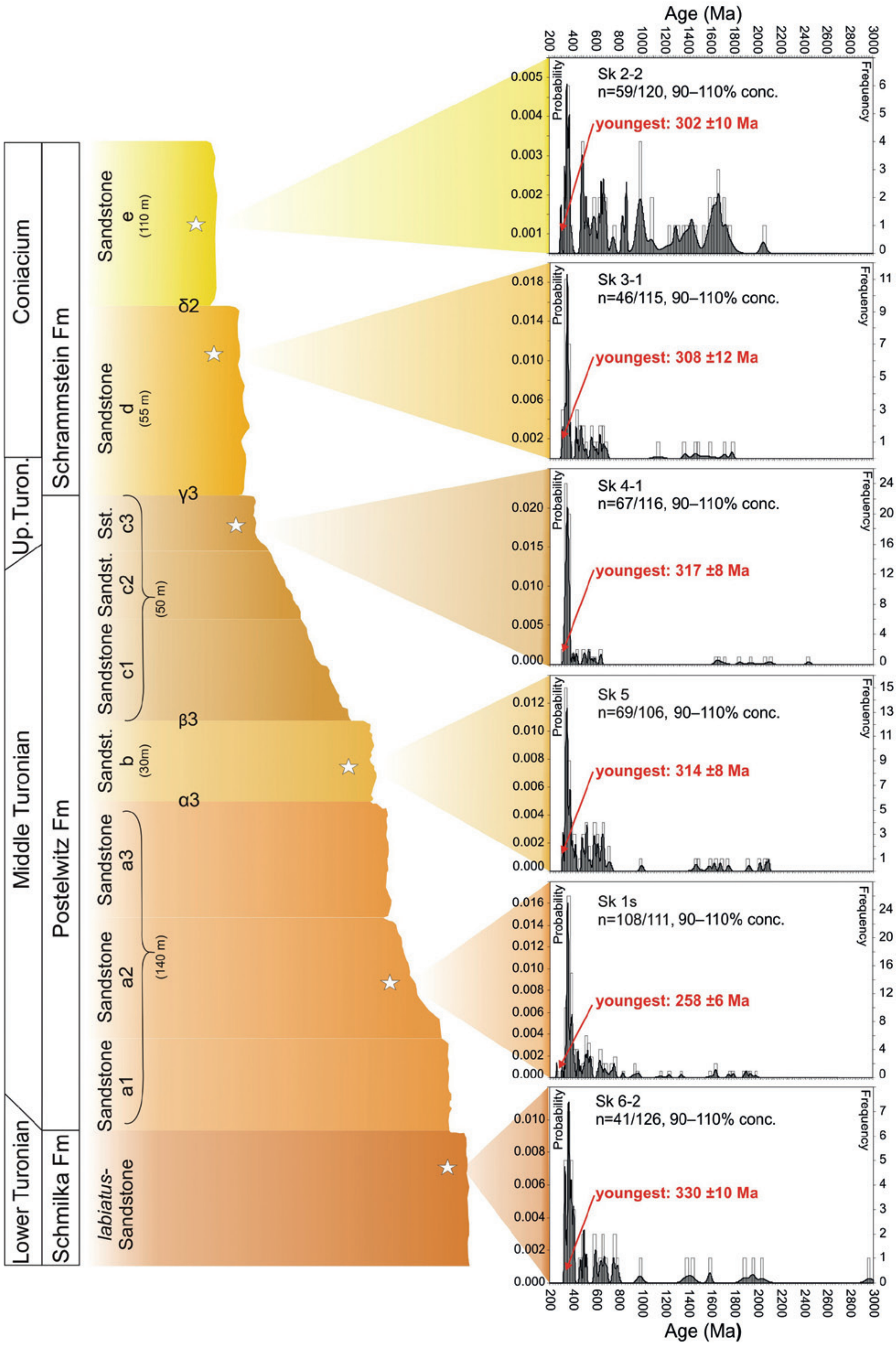
Apatite cooling ages of the Lausitz Block (Lange et al. 2008) and of the Karkonosze Mts. (Danišik et al. 2010)


Lower Turonian
Middle Turonian
Up.Turon.
Coniacium
Schmilka Fm
Postelwitz Fm
Schrammstein Fm
labiatus-Sandstone
Sandstone a1
Sandstone a2
Sandstone a3
(140 m)
Sandst. b
(30m)
Sandstone c1
Sandst. c2
Sst. c3
(50 m)
Sandstone d
(55 m)
Sandstone e
(110 m)
α3
β3
γ3
δ2
Age (Ma)
Probability
Frequency
Sk 2-2
n=59/120, 90–110% conc.
youngest: 302 ±10 Ma
Sk 3-1
n=46/115, 90–110% conc.
youngest: 308 ±12 Ma
Sk 4-1
n=67/116, 90–110% conc.
youngest: 317 ±8 Ma
Sk 5
n=69/106, 90–110% conc.
youngest: 314 ±8 Ma
Sk 1s
n=108/111, 90–110% conc.
youngest: 258 ±6 Ma
Sk 6-2
n=41/126, 90–110% conc.
youngest: 330 ±10 Ma

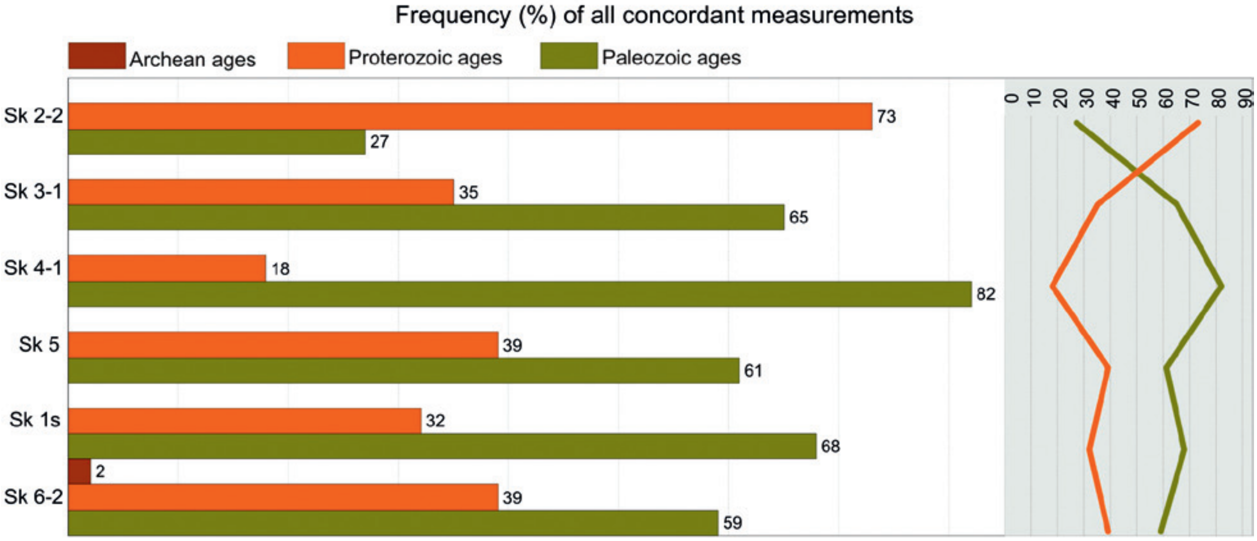


Fig. 4. Diagrams showing change in age classes (Archean, Proterozoic and Palaeozoic) for all analysed sandstones. Note the sudden increase of Proteorzoic ages in the uppermost sample (Sk 2-2, Sandstone e, Schrammstein Formation) in comparison to the five samples below.

Abb. 4. Darstellung der Veränderung der Altersklassen für alle analysierten Sandsteine. Auffällig ist die plötzliche Zunahme proterozoischer Alter in der obersten Probe (Sk 2-2) im Vergleich zu den fünf darunterliegenden Proben.

prove an enormous Late Cretaceous uplift of the Lausitz Block ca. 50 to 85 Ma ago (Lange et al. 2008). Uplift and fast cooling happened in two stages also in the Karkonosze Mts. at ca. 82–90 Ma and at 77–91 Ma (Danišik et al. 2010). This uplift resulted in the removal of about 3–4 km of overburden (estimated denudation rate of ca. 100 m/1 Ma for the Lausitz Block, Lange et al. 2008). On the base of pebble composition close to the Lausitz Thrust and these cooling ages, Voigt (2009) concluded that eroded units were initially represented by a thick sedimentary pile of Triassic to Early Cretaceous sediments which were redeposited in an upside-down succession (first youngest, last oldest). As the uppermost Cretaceous sandstones show no evidence of a granodioritic source and most cooling ages indicate a Santonian to Campanian uplift, a much thicker primary thickness of Cretaceous sediments can be assumed.

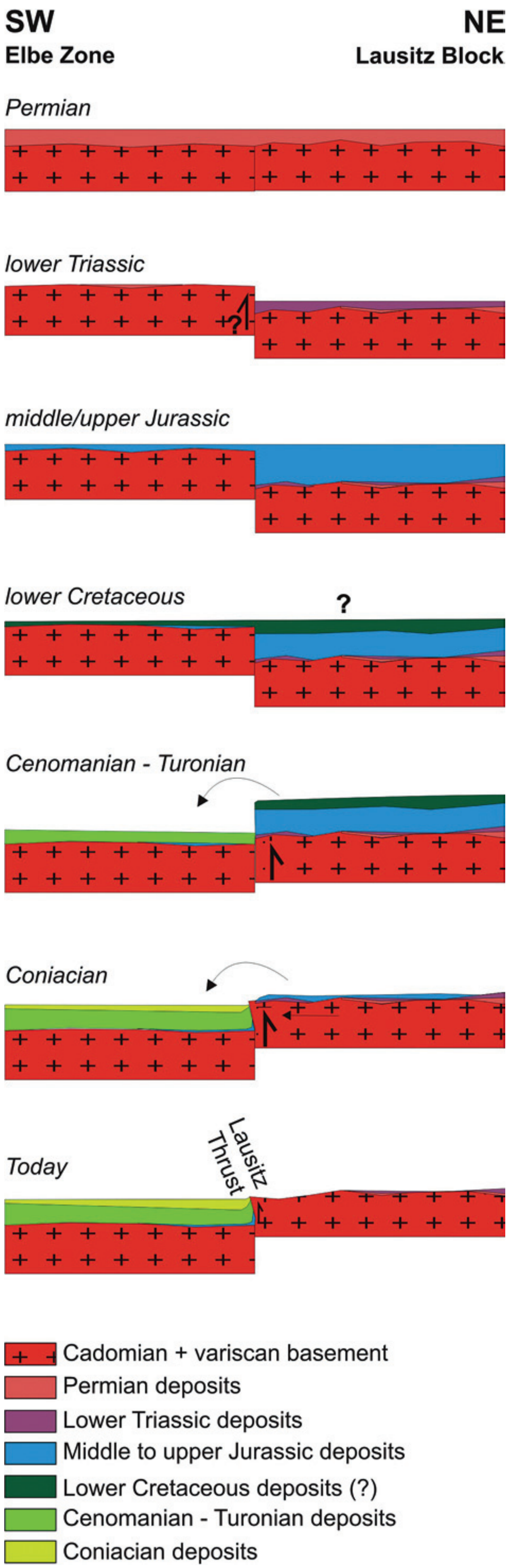
Triassic sandstones were assumed as source for the higher parts of the Late Cretaceous succession in the Elbsandsteingebirge (Voigt 1994). But the predominance of Baltica ages (Meso-Palaeoproterozoic) in the highest preserved units indicates that they did not provide a significant amount of sands to the basin fill until the early Coniacian. We propose a later redeposition of Triassic sands. This is in agreement with cooling ages of the Lausitz Block (Lange et al. 2008) and the Karkonosze Mts. (Danišik et al. 2010) and the comparison with better preserved basins, proving a Santonian to Campanian peak of inversion tectonics.

Unfortunately, there are no younger Upper Cretaceous sediments than Lower Coniacian left in the study area. Because of that, we can only assume that the Triassic and Permian sediments, lying below the Jurassic deposits, got eroded later too, and, maybe, even a part of the granodiorite of the Lausitz Block itself, in the uppermost Cretaceous. These "evidences" where probably eroded during the big Late Cretaceous to Early Palaeogene weathering.

Additionally, we assume regional uplift of the Lausitz and the Bohemian Massif after inversion, because most of the Cretaceous deposits of the Bohemian Cretaceous Basin had been removed before the Miocene.

Fig. 3. Section of the Elbsandsteingebirge around Schmilka (Großer Winterberg region) based on Lamprecht (1928), Tröger (in Pälchen & Walter 2008) and own field observations. One sample of each sandstone unit was analysed. Sample points are indicated. Age-Display diagrams of all samples showing concordant U/Pb zircon ages (x-axis) versus probability and frequency (y-axis) after Sircombe (2004) are based on 1 σ errors. All measurements with a degree of concordance between 90 and 110 % were regarded as concordant and used for the diagrams. $^{206}Pb/^{238}U$-ratios were used for age calculation of all ages below 1000 Ma. For older grains $^{207}Pb/^{206}Pb$-ratios were used for age calculation. Youngest concordant single zircon age of each sample is given with 2 σ error.

Abb. 3. Geologischer Schnitt durch das Elbsandsteingebirge bei Schmilka (Region Großer Winterberg) basierend auf Lamprecht (1928), Tröger (in Pälchen & Walter 2008) und eigenen Geländeaufnahmen. Pro Sandsteineinheit wurde eine Probe analysiert. Die Probenahmeniveaus sind durch weißen Sternchen markiert. Das AgeDisplay Diagramm jeder Probe zeigt die U/Pb-Zirkonalter (x-Achse) aufgetragen gegen die Wahrscheinlichkeit und Häufigkeit (y-Achse), basierend auf einem 1-σ-Fehler (Sircombe 2004). Alle Messungen mit einer Konkordanz zwischen 90 und 110% wurden als konkordant angesehen und zur Erstellung dieser Diagramme genutzt. Zur Altersberechnung für Alter unter 1000 Ma wurden die $^{206}Pb/^{238}U$-Verhältnisse verwendet. Für höhere Alter wurde das $^{207}Pb/^{206}Pb$-Verhältnis herangezogen. Das jüngste konkordante Einzelzirkonalter für jede Probe ist angegeben (2-σ-Fehler).



5. Summary

The main results of this study can be summarized in seven points:

The Lausitz Block was a part of the West-Sudetic Island and covered with Triassic, Jurassic and probably Lower Createaceous sediments. It was the most probable source area for the Upper Cretaceous sandstones of the Elbtal Group.

—

The determined zircon ages from the Palaeozoic to Late Neoproterozoic are interpreted as signals of reworked local material, such as the Variscan and Cadomian basement units and their Palaeozoic cover sequences.

—

The zircon U/Pb-age spectra show a sudden input of Meso- and Palaeoproterozoic ages in the uppermost part of the Schmilka section (sample Sk 2-2, Sandstone e, Fig. 3), that can only be interpreted as reworking of siliciclastic Jurassic material (Middle Jurassic).

—

Erosion of these Jurassic sediments started not earlier than in the Coniacian (Fig. 5).

—

Most zircon grains represented in this study experienced at least their second cycle of recycling during the Late Cretaceous sedimentation.

—

The minor amounts of ca. 540 Ma ages in all samples confirm the Mesozoic cover of the Cadomian basement units of the Lausitz Block. The latter ones were not avail-

Fig. 5. Model of inversion and syntectonic redeposition of the Mesozoic cover of the Lausitz Block (based on Voigt 2009 and the recent study) showing sedimentation and tectonic activity along the Lausitz Thrust during the Mesozoic. Uplift of the Lausitz Block started in the lower Upper Cretaceous (Middle Cenomanian). From that time on, the Mesozoic cover of the Lausitz Block was the main source area for the sediments of the Saxonian Cretaceous Basin. Erosion of Middle Jurassic siliciclastic sediments started in the Coniacian. Older (Triassic) sediments and early Cambrian granodiorites did probably not contribute to the formation of Upper Cretaceous deposits in Saxony.

Abb. 5. Model zur Sedimentation und tektonischen Aktivität entlang der Lausitzer Überschiebung während des Mesozoikums (basierend auf Voigt 2009 und den Ergebnissen dieser Studie). Die Hebung des Lausitz-Blocks begann in der unteren Oberkreide (mittleres Cenoman). Die auflagernden mesozoischen Sedimente des invertierten Lausitz-Blocks waren die Hauptquelle für die Sandsteine des Elbsandsteingebirges. Die Abtragung mitteljurassischer siliziklastischer Sedimente begann im Coniac. Ältere (triassische) Sedimente und der heute in der Lausitz dominierende Granodiorit trugen vermutlich nicht zur Sedimentbildung der sächsischen Oberkreide bei.

able for erosion until at least Middle to Late Coniacian times (most probably even later).

—

The presented section does not show a real inversion with Cadomian ages (mainly ca. 540 and ca. 570 Ma) of the Lausitz Block on top. According to cooling ages and compared with better preserved basins this inversion took place during the Santonian to Campanian, which is too young for the Schmilka – Großer Winterberg section.

6. Acknowledgement

We would particularly like to thank Dr. Jan-Michael Lange (Senckenberg Naturhistorische Sammlungen Dresden) for various corrections, advises, and references that helped to improve this paper.

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Table 1. LA-SF-ICP-MS U, Pb, and Th data of single zircon grains from the Upper Cretaceous sandstones of the Schmilka section (Elbsandsteingebirge).
Name of the sample as well as GPS coordinates, geological formation, stratigraphic age, amount of measured zircon grains and amount of concordant (within 90 to 110% of concordance) analyses are given for each sample as first line on top of the data. — Italic/grey: discordant analyses (not in the range of 90–110 % of degree of concordance)

Tabelle 1. LA-SF-ICP-MS U, Pb und Th Daten von einzelnen Zirkonen der oberkretazischen Sandsteine des Schmilka Profils (Elbsandsteingebirge).
Der Probenname, die GPS Koordinaten, geologische Formation, stratigraphisches Alter, Anzahl der gemessenen Zirkone und Anzahl der konkordanten (innerhalb einer Konkordanz von 90 bis 110%) Analysen sind für jede Probe in der ersten Zeile über den jeweiligen Daten angegeben. — Kursiv/grau: diskordante Analysen (außerhalb des 90–110% Bereichs der Konkordanz)

Sk 1s (Sandstone a, Postelwitz Formation, Middle Turonian) — 50° 54′ 06.7″ N; 14° 13′ 07.5″ E, measured single zircon grains: 111, concordant within 90 – 110% of concordance: 108

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a2	16879	233	15	1.16	6298	0.05563	1.9	0.4117	2.6	0.05368	1.8	0.74	349	7	350	8	358	40	98
a3	18147	253	14	0.32	2904	0.05727	2.0	0.4250	2.5	0.05382	1.5	0.79	359	7	360	8	364	34	99
a4	17190	190	11	0.67	854	0.05593	3.7	0.4169	4.3	0.05406	2.0	0.88	351	13	354	13	374	46	94
a5	16084	105	13	1.30	4771	0.10264	2.1	0.8571	2.8	0.06056	1.8	0.75	630	12	629	13	624	39	101
a6	12584	56	9	0.68	5008	0.13822	2.1	1.2827	3.7	0.06731	3.0	0.57	835	17	838	21	847	63	98
a8	4666	57	3	0.14	5611	0.06203	2.2	0.4660	3.5	0.05449	2.8	0.62	388	8	388	12	391	62	99
a9	60717	514	44	0.70	519	0.08163	2.0	0.6513	3.4	0.05786	2.8	0.57	506	10	509	14	525	62	96
a10	15228	217	12	0.46	9701	0.05594	2.0	0.4138	2.8	0.05365	1.9	0.73	351	7	352	8	356	42	98
a11	12284	177	10	0.49	13654	0.05455	2.1	0.4009	2.9	0.05330	2.1	0.71	342	7	342	9	342	47	100
a13	13431	148	11	0.36	8938	0.07895	1.9	0.6203	2.9	0.05698	2.2	0.66	490	9	490	11	491	48	100
a14	49012	422	32	0.38	984	0.07479	1.9	0.5862	3.1	0.05684	2.4	0.63	465	9	468	12	485	53	96
a16	17982	256	15	0.54	33575	0.05660	2.3	0.4199	3.3	0.05381	2.4	0.71	355	8	356	10	363	53	98
a17	14674	157	11	1.29	654	0.05581	2.2	0.4120	7.1	0.05354	6.7	0.31	350	8	350	21	352	152	100
a18	33982	419	23	0.34	824	0.05352	2.1	0.3934	4.4	0.05332	3.8	0.49	336	7	337	13	342	87	98
a19	73965	111	37	0.68	27675	0.30334	2.1	4.8434	2.4	0.11580	1.2	0.87	1708	31	1792	20	1892	21	90
a20	45680	94	25	0.60	53210	0.24383	2.0	2.8972	2.5	0.08618	1.4	0.83	1407	26	1381	19	1342	27	105
a21	11687	171	11	1.33	2286	0.05663	1.9	0.4258	2.8	0.05453	2.1	0.67	355	7	360	9	393	47	90
a22	29757	321	28	0.69	2456	0.08421	1.8	0.6882	2.4	0.05927	1.6	0.74	521	9	532	10	577	36	90
a24	66297	649	141	0.43	10603	0.06143	10.0	0.4589	10.1	0.05418	1.2	0.99	384	38	384	33	379	26	101
a25	26647	35	14	0.91	1478	0.34251	2.4	5.7494	3.2	0.12174	2.2	0.74	1899	40	1939	28	1982	39	96
a27	10446	65	8	0.64	4528	0.11133	2.3	0.9449	4.5	0.06156	3.8	0.52	680	15	675	22	659	82	103
a28	2372	14	2	0.77	881	0.12442	2.2	1.1022	4.6	0.06425	4.1	0.47	756	15	754	25	750	87	101
a29	21211	295	17	0.42	2719	0.05516	1.9	0.4060	3.2	0.05339	2.5	0.61	346	7	346	9	346	57	100
a30	5874	86	6	1.15	3146	0.05608	2.0	0.4141	3.9	0.05355	3.3	0.53	352	7	352	12	352	74	100
a31	6787	63	5	0.15	2103	0.08919	3.0	0.7173	4.3	0.05832	3.1	0.70	551	16	549	18	542	67	102
a32	6009	90	5	0.45	3150	0.05849	2.3	0.4369	3.4	0.05416	2.5	0.67	366	8	368	10	378	56	97
a33	27608	281	26	0.47	4987	0.09107	2.4	0.7477	2.8	0.05954	1.6	0.84	562	13	567	12	587	34	96
a35	11322	171	10	0.49	12448	0.05722	1.9	0.4238	2.7	0.05372	2.0	0.68	359	6	359	8	359	45	100

Table 1 — Sk 1s (Sandstone a, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U^b	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a36	35196	60	19	0.79	5707	0.29938	3.6	4.4249	3.8	0.10720	1.4	0.93	1688	53	1717	32	1752	25	96
a37	4784	72	5	1.56	8917	0.05690	2.0	0.4214	3.3	0.05371	2.7	0.59	357	7	357	10	359	61	99
a38	4429	59	3	0.20	1504	0.05719	2.3	0.4235	3.9	0.05370	3.2	0.59	359	8	359	12	359	71	100
a40	21425	104	11	0.61	2868	0.10137	2.1	1.0575	3.2	0.07566	2.4	0.66	622	13	733	17	1086	49	57
a41	5689	12	3	1.06	1496	0.20192	2.5	2.1828	3.7	0.07840	2.8	0.67	1186	27	1176	26	1157	55	102
a42	10428	111	7	0.83	19756	0.05601	2.0	0.4143	3.2	0.05365	2.5	0.64	351	7	352	10	356	55	99
a43	17671	196	12	0.67	6807	0.05679	2.9	0.4203	3.3	0.05368	1.6	0.88	356	10	356	10	358	35	100
a44	12431	10	3	0.90	1725	0.29801	3.1	4.0515	4.1	0.09860	2.6	0.77	1681	46	1645	34	1598	49	105
a47	7230	64	4	0.63	5398	0.06051	3.0	0.4518	4.0	0.05416	2.6	0.75	379	11	379	13	378	59	100
a49	20094	130	10	0.81	10588	0.07103	1.9	0.5458	2.4	0.05573	1.4	0.79	442	8	442	9	442	32	100
a50	17929	130	8	0.26	8607	0.06401	2.1	0.4826	2.8	0.05468	1.8	0.75	400	8	400	9	399	41	100
a51	72599	333	12	0.33	170	0.02968	4.3	0.2322	6.0	0.05672	4.1	0.72	189	8	212	11	481	91	39
a52	14695	69	4	0.13	708	0.06114	3.1	0.4583	10.2	0.05436	9.7	0.31	383	12	383	33	386	218	99
a53	54144	301	15	0.43	237	0.04859	2.2	0.3528	4.6	0.05266	4.0	0.47	306	7	307	12	314	92	97
a54	72365	41	18	0.87	61127	0.39102	1.9	6.4101	2.2	0.11890	1.1	0.87	2128	34	2034	19	1940	19	110
a55	20642	75	7	0.69	5763	0.08568	1.9	0.6807	3.4	0.05762	2.9	0.55	530	10	527	14	515	63	103
a57	9612	56	4	1.10	17684	0.06199	1.9	0.4642	3.2	0.05431	2.6	0.60	388	7	387	10	384	58	101
a58	103260	42	17	0.86	8933	0.35695	2.0	5.7456	2.3	0.11674	1.0	0.90	1968	35	1938	20	1907	17	103
a59	20271	71	5	0.08	13674	0.08069	1.9	0.6373	4.0	0.05729	3.5	0.48	500	9	501	16	503	76	100
a60	6703	35	3	1.93	1633	0.06569	2.2	0.5011	3.1	0.05532	2.1	0.73	410	9	412	10	425	46	96
a62	7027	34	2	1.18	12849	0.06339	2.1	0.4772	3.9	0.05460	3.3	0.53	396	8	396	13	396	75	100
a63	6578	17	3	0.32	956	0.17119	2.4	1.6619	3.5	0.07041	2.6	0.68	1019	23	994	22	940	52	108
a65	29895	72	5	0.22	742	0.07690	5.2	0.5996	6.2	0.05655	3.3	0.84	478	24	477	24	474	73	101
a66	10564	44	3	0.25	19576	0.06107	2.4	0.4555	3.0	0.05410	1.8	0.79	382	9	381	10	375	41	102
b2	4298	76	5	0.70	896	0.05698	2.6	0.4209	4.0	0.05358	3.1	0.65	357	9	357	12	353	69	101
b3	48296	184	30	0.06	14076	0.17134	2.3	1.6892	2.6	0.07150	1.2	0.89	1019	22	1004	17	972	25	105
b4	43002	140	30	0.40	52115	0.20917	2.2	2.3504	2.6	0.08149	1.3	0.86	1224	25	1228	19	1233	26	99
b5	43619	416	35	0.37	2653	0.08233	2.4	0.6494	3.3	0.05721	2.2	0.75	510	12	508	13	500	47	102
b6	40464	185	34	0.67	56397	0.17259	2.3	1.6729	3.0	0.07030	1.9	0.77	1026	22	998	19	937	39	110
b7	12801	204	12	0.22	23560	0.06004	2.4	0.4437	3.2	0.05360	2.0	0.77	376	9	373	10	354	45	106
b8	19599	352	19	0.23	11825	0.05632	2.4	0.4161	4.4	0.05358	3.7	0.54	353	8	353	13	353	83	100
b9	7579	77	8	0.70	3127	0.10285	2.7	0.8590	6.1	0.06057	5.5	0.44	631	16	630	29	624	118	101
b10	9623	72	8	0.07	10075	0.12571	3.1	1.1015	3.9	0.06355	2.3	0.80	763	23	754	21	727	50	105
b13	16392	160	11	0.35	460	0.06480	2.9	0.4893	10.3	0.05476	9.9	0.28	405	11	404	35	403	222	101
b15	27243	317	27	0.20	15287	0.09001	2.2	0.7122	2.9	0.05738	1.8	0.78	556	12	546	12	506	40	110
b16	5807	75	5	0.23	1489	0.06465	3.3	0.4916	4.9	0.05514	3.6	0.67	404	13	406	17	418	81	97

Table 1 — Sk 1s (Sandstone a, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b17	29449	217	28	0.61	45256	0.12386	2.3	1.0891	3.3	0.06378	2.4	0.69	753	16	748	18	734	51	103
b18	24206	196	28	1.89	1452	0.11911	3.3	1.0294	4.7	0.06268	3.3	0.70	725	23	719	24	697	71	104
b19	16395	265	17	0.73	2760	0.05958	2.4	0.4463	4.5	0.05432	3.9	0.53	373	9	375	14	385	87	97
b20	65001	119	48	1.99	14247	0.30769	2.2	4.2697	2.5	0.10064	1.2	0.88	1729	34	1688	21	1636	22	106
b21	26419	447	26	0.56	2465	0.05598	2.2	0.4150	3.8	0.05376	3.1	0.57	351	7	352	11	361	70	97
b22	116528	210	72	0.89	11615	0.30956	2.4	4.3047	2.6	0.10085	1.1	0.91	1739	36	1694	22	1640	20	106
b24	6943	130	8	0.63	2044	0.05763	2.5	0.4298	4.0	0.05409	3.1	0.63	361	9	363	12	375	70	96
b25	10773	95	10	2.12	483	0.07197	2.6	0.5497	7.8	0.05539	7.4	0.33	448	11	445	28	428	164	105
b26	51029	467	56	0.46	5303	0.12115	3.0	1.0481	3.2	0.06275	1.0	0.95	737	21	728	17	700	22	105
b27	11579	239	14	0.92	21407	0.05477	2.3	0.4044	3.2	0.05356	2.1	0.74	344	8	345	9	352	48	98
b28	6435	56	7	0.81	1986	0.11419	2.6	0.9757	3.6	0.06197	2.5	0.72	697	17	691	18	673	53	104
b29	2486	51	3	1.19	1200	0.05695	2.7	0.4232	5.6	0.05389	4.9	0.49	357	10	358	17	366	110	97
b30	6127	114	8	0.73	8714	0.06152	2.9	0.4619	6.1	0.05446	5.4	0.48	385	11	386	20	390	120	99
b31	4711	44	5	0.48	7773	0.10299	2.6	0.8461	4.0	0.05958	2.9	0.67	632	16	622	19	588	64	107
b32	17813	176	15	0.26	961	0.08882	2.3	0.7113	4.0	0.05808	3.3	0.56	549	12	545	17	533	73	103
b33	17231	245	18	1.08	441	0.06700	2.6	0.5110	5.5	0.05532	4.9	0.46	418	10	419	19	425	109	98
b36	7259	132	8	0.33	2431	0.06218	2.3	0.4657	3.1	0.05432	2.1	0.74	389	9	388	10	384	47	101
b37	12672	112	13	0.91	7781	0.10531	2.5	0.8856	3.9	0.06099	3.0	0.63	645	15	644	19	639	65	101
b38	31886	455	29	0.41	2472	0.06254	2.2	0.4668	3.5	0.05413	2.7	0.63	391	8	389	11	377	62	104
b39	11016	189	11	0.48	3667	0.05735	2.2	0.4228	4.1	0.05347	3.4	0.54	360	8	358	12	349	77	103
b40	10963	117	12	1.98	3305	0.08570	2.2	0.6790	3.2	0.05746	2.4	0.68	530	11	526	13	509	52	104
b41	13126	94	12	1.20	21081	0.10984	2.3	0.9266	2.9	0.06118	1.8	0.79	672	15	666	14	646	38	104
b42	10977	105	9	0.89	2015	0.08266	2.4	0.6577	3.2	0.05771	2.2	0.74	512	12	513	13	519	48	99
b43	6769	37	4	0.94	4072	0.08798	2.7	0.6986	3.9	0.05759	2.7	0.71	544	14	538	16	514	60	106
b44	21435	283	16	0.62	11804	0.05574	2.2	0.4099	2.5	0.05333	1.3	0.87	350	8	349	8	343	29	102
b46	23982	198	17	0.40	2289	0.08589	2.6	0.6861	3.8	0.05793	2.8	0.69	531	13	530	16	527	60	101
b47	17831	208	12	0.35	32750	0.05985	2.4	0.4436	3.3	0.05376	2.2	0.74	375	9	373	10	361	50	104
b48	4666	80	4	0.81	8955	0.04080	2.1	0.2888	3.2	0.05133	2.4	0.66	258	5	258	7	256	55	101
b49	17669	154	9	0.45	1828	0.05644	2.6	0.4191	4.9	0.05386	4.2	0.53	354	9	355	15	365	94	97
b50	6469	72	5	2.14	12013	0.05449	2.3	0.3986	3.3	0.05305	2.3	0.71	342	8	341	10	331	52	103
b51	20305	184	10	0.47	1164	0.05172	2.1	0.3791	4.2	0.05317	3.6	0.50	325	7	326	12	336	82	97
b52	36046	354	19	0.23	66853	0.05628	2.2	0.4129	2.8	0.05322	1.7	0.80	353	8	351	8	338	38	104
b53	7963	74	4	0.55	3474	0.05829	2.4	0.4355	3.3	0.05418	2.3	0.72	365	8	367	10	379	51	96
b54	5956	28	3	0.84	1720	0.10014	2.3	0.8506	3.4	0.06160	2.5	0.68	615	14	625	16	660	53	93
b55	12436	91	6	0.02	1140	0.07158	2.6	0.5502	6.7	0.05574	6.2	0.39	446	11	445	24	442	137	101
b57	36980	304	16	0.17	68152	0.05714	2.3	0.4200	2.8	0.05331	1.7	0.81	358	8	356	9	342	37	105

Table 1 — Sk 1s (Sandstone a, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b58	21053	129	8	0.21	37625	0.06333	2.5	0.4835	2.7	0.05536	1.2	0.90	396	9	400	9	427	27	93
b59	13317	122	6	0.20	820	0.05407	3.3	0.3967	6.2	0.05322	5.2	0.54	339	11	339	18	338	118	100
b60	7469	53	4	0.68	618	0.06310	2.2	0.4788	5.6	0.05503	5.2	0.39	394	8	397	19	413	116	95
b61	61786	41	13	0.73	10712	0.28984	2.4	4.3776	2.6	0.10954	1.0	0.92	1641	34	1708	22	1792	19	92
b62	11722	39	4	0.82	18694	0.10681	2.5	0.9045	4.0	0.06142	3.2	0.61	654	15	654	20	654	69	100
b63	31154	145	12	1.04	1013	0.07185	3.4	0.5574	4.4	0.05626	2.8	0.77	447	15	450	16	463	61	97
b64	9014	62	4	1.33	16708	0.05564	2.3	0.4074	3.0	0.05311	1.9	0.77	349	8	347	9	334	43	105
b65	6400	42	2	0.57	11781	0.05610	2.8	0.4144	3.5	0.05358	2.2	0.78	352	9	352	11	354	50	99
b66	20551	72	7	0.73	3069	0.08429	2.8	0.6704	3.9	0.05768	2.7	0.73	522	14	521	16	518	59	101

Table 1 — aSk 2-2 (Sandstone e, Schrammstein Formation, Lower Coniacium) — 50° 54′ 32.9″ N; 14° 14′ 33.4″ E, measured single zircon grains: 120, concordant within 90 – 110% of concordance: 59

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a1	433	13	1	0.92	836	0.04797	3.7	0.3476	12.7	0.05256	12.2	0.29	302	11	303	34	310	278	98
a2	*2393*	*51*	*4*	*0.95*	*4130*	*0.06091*	*3.5*	*0.4900*	*6.3*	*0.05834*	*5.2*	*0.55*	*381*	*13*	*405*	*21*	*543*	*115*	*70*
a3	*4080*	*86*	*5*	*0.24*	*6799*	*0.05148*	*3.6*	*0.4275*	*8.9*	*0.06022*	*8.1*	*0.40*	*324*	*11*	*361*	*27*	*612*	*176*	*53*
a4	9367	151	11	0.12	16402	0.07770	3.5	0.6174	5.4	0.05763	4.1	0.65	482	16	488	21	516	90	94
a5	*4432*	*92*	*6*	*0.33*	*1579*	*0.05811*	*3.9*	*0.5310*	*4.8*	*0.06627*	*2.8*	*0.81*	*364*	*14*	*432*	*17*	*815*	*59*	*45*
a6	*4766*	*36*	*5*	*0.89*	*594*	*0.09969*	*3.6*	*1.4989*	*36.5*	*0.10905*	*36.4*	*0.10*	*613*	*21*	*930*	*251*	*1784*	*663*	*34*
a7	36839	96	29	0.27	5542	0.28593	4.6	3.8611	5.3	0.09794	2.5	0.88	1621	67	1606	43	1585	47	102
a8	17909	97	18	0.20	16970	0.18418	3.3	1.9192	4.1	0.07558	2.5	0.80	1090	33	1088	28	1084	50	101
a9	*8641*	*189*	*9*	*0.28*	*13201*	*0.04660*	*4.0*	*0.4291*	*7.0*	*0.06679*	*5.7*	*0.58*	*294*	*12*	*363*	*22*	*831*	*119*	*35*
a10	*8190*	*137*	*12*	*0.48*	*1633*	*0.08138*	*5.0*	*0.6743*	*6.8*	*0.06010*	*4.7*	*0.73*	*504*	*24*	*523*	*28*	*607*	*101*	*83*
a11	4527	80	7	0.25	2345	0.08671	3.2	0.7085	5.9	0.05926	4.9	0.54	536	16	544	25	577	107	93
a12	*4164*	*108*	*6*	*0.30*	*6747*	*0.05577*	*3.9*	*0.4204*	*5.7*	*0.05467*	*4.2*	*0.68*	*350*	*13*	*356*	*17*	*399*	*93*	*88*
a13	12024	195	15	0.20	3365	0.07849	4.3	0.6300	5.2	0.05821	3.0	0.82	487	20	496	21	538	65	91
a14	38631	68	27	0.31	12568	0.37045	2.4	6.4720	3.6	0.12671	2.7	0.67	2032	43	2042	32	2053	47	99
a15	*6564*	*82*	*9*	*0.72*	*1240*	*0.09153*	*5.5*	*0.7898*	*6.6*	*0.06259*	*3.6*	*0.83*	*565*	*30*	*591*	*30*	*694*	*77*	*81*
a16	*2370*	*60*	*4*	*0.16*	*1948*	*0.06337*	*3.7*	*0.5125*	*8.1*	*0.05865*	*7.2*	*0.45*	*396*	*14*	*420*	*28*	*554*	*158*	*71*

Table 1 — aSk 2-2 (Sandstone e, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	^{206}Pb/^{204}Pb	^{206}Pb/^{238}U[c]	2 σ	^{207}Pb/^{235}U[c]	2 σ	^{207}Pb/^{206}Pb[e]	2 σ	Rho[d]	^{206}Pb/^{238}U	2 σ	^{207}Pb/^{235}U	2 σ	^{207}Pb/^{206}Pb	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a17	6071	166	9	0.30	8106	0.05208	3.4	0.3921	4.7	0.05460	3.3	0.72	327	11	336	14	396	73	83
a18	71867	294	71	0.39	7203	0.22311	2.6	2.5849	3.0	0.08403	1.4	0.88	1298	31	1296	22	1293	28	100
a19	2887	86	5	0.18	5095	0.05981	4.2	0.4729	6.7	0.05734	5.3	0.62	374	15	393	22	505	116	74
a20	5208	125	7	0.03	2263	0.06040	4.3	0.5001	7.2	0.06005	5.8	0.60	378	16	412	25	605	125	62
a21	3535	71	5	0.14	1429	0.06370	4.2	0.6556	7.7	0.07465	6.5	0.54	398	16	512	32	1059	131	38
a22	21863	66	22	0.51	22024	0.29645	2.8	4.1297	4.4	0.10103	3.3	0.65	1674	42	1660	36	1643	62	102
a23	7292	19	7	0.70	6922	0.31463	2.2	4.6191	4.6	0.10648	4.0	0.49	1763	35	1753	39	1740	73	101
a24	32836	105	33	0.39	9829	0.28868	4.3	3.9929	4.8	0.10032	2.1	0.90	1635	63	1633	40	1630	39	100
a25	895	6	2	1.52	1194	0.18496	4.6	1.9356	9.5	0.07590	8.2	0.49	1094	47	1093	65	1092	165	100
a26	6318	122	10	0.16	3733	0.08013	5.8	0.6601	6.7	0.05975	3.4	0.86	497	28	515	27	594	74	84
a27	11173	170	15	0.35	935	0.08335	5.9	0.8012	6.2	0.06972	1.9	0.95	516	29	597	28	920	39	56
a28	73061	236	68	0.11	3751	0.28737	2.7	4.0190	4.0	0.10143	2.9	0.68	1628	39	1638	33	1650	54	99
a29	27395	91	30	0.30	8762	0.31467	5.2	4.6682	7.7	0.10760	5.7	0.67	1764	80	1762	66	1759	103	100
a30	13114	106	20	0.28	2367	0.17897	3.9	1.7669	5.3	0.07160	3.6	0.73	1061	38	1033	35	975	74	109
a31	3073	83	7	0.49	5478	0.07740	4.3	0.6044	7.0	0.05663	5.5	0.62	481	20	480	27	477	121	101
a32	19391	495	24	0.08	714	0.04964	3.1	0.4542	5.5	0.06636	4.5	0.57	312	10	380	18	818	94	38
a33	2199	73	4	0.39	4049	0.05811	4.7	0.4412	7.0	0.05507	5.2	0.67	364	17	371	22	415	117	88
a34	4040	61	7	0.43	6548	0.11124	5.4	0.9585	7.4	0.06249	5.0	0.73	680	35	683	37	691	107	98
a35	5490	101	10	0.22	1357	0.09492	6.4	0.8679	7.6	0.06632	4.0	0.85	585	36	634	36	817	84	72
a36	2508	59	6	0.13	4267	0.09705	5.2	0.7964	6.9	0.05952	4.6	0.75	597	29	595	31	586	99	102
a37	10983	188	18	0.23	3416	0.09645	4.3	0.8636	6.5	0.06494	4.9	0.66	594	24	632	31	772	103	77
a38	907	25	2	0.50	1673	0.06201	6.4	0.4670	9.7	0.05462	7.4	0.65	388	24	389	32	397	166	98
a39	29969	469	45	0.47	876	0.08159	3.7	0.7972	6.0	0.07086	4.7	0.61	506	18	595	27	953	97	53
a40	4061	108	7	0.18	1939	0.06159	4.3	0.5044	7.5	0.05940	6.1	0.57	385	16	415	26	582	133	66
a41	1848	63	3	0.78	3433	0.03895	6.7	0.2937	10.4	0.05469	7.9	0.65	246	16	261	24	400	177	62
a42	3863	48	6	0.91	2502	0.09353	8.7	0.7381	9.5	0.05723	3.8	0.92	576	48	561	42	501	84	115
a43	6685	169	10	0.26	5536	0.05673	4.2	0.4269	5.3	0.05457	3.2	0.80	356	15	361	16	395	71	90
a44	21585	50	16	0.28	21041	0.30019	6.8	4.3198	9.3	0.10437	6.3	0.73	1692	101	1697	79	1703	116	99
a45	15798	227	19	0.17	319	0.08467	4.4	0.7016	7.5	0.06010	6.0	0.60	524	22	540	32	607	130	86
a46	5805	36	6	0.42	8194	0.16529	4.9	1.6344	6.1	0.07171	3.6	0.80	986	45	984	39	978	74	101
a47	7494	166	10	0.28	13752	0.05724	5.0	0.4348	9.1	0.05510	7.5	0.56	359	18	367	28	416	168	86
a48	3555	78	5	0.42	2860	0.05646	5.6	0.4177	7.2	0.05365	4.5	0.78	354	19	354	22	356	102	99
a49	2162	42	1	0.12	3873	0.03118	12.4	0.2423	14.5	0.05636	7.5	0.85	198	24	220	29	467	166	42
a50	2891	26	3	0.32	1916	0.10918	4.7	0.9349	8.0	0.06210	6.5	0.58	668	30	670	40	678	139	99
a51	531	5	0	0.19	297	0.08981	4.2	0.8623	16.8	0.06963	16.2	0.25	554	23	631	82	918	333	60
a52	10885	55	7	0.29	261	0.10048	2.5	1.4690	15.6	0.10603	15.4	0.16	617	15	918	99	1732	282	36

Table 1 — aSk 2-2 (Sandstone e, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a53	8684	97	7	0.29	327	0.06427	6.5	0.7989	8.3	0.09015	5.2	0.78	402	25	596	38	1429	100	28
a54	529	6	1	0.89	646	0.06410	5.3	0.7209	25.8	0.08157	25.3	0.20	400	20	551	116	1235	496	32
a55	18165	170	19	0.01	6544	0.12360	4.5	1.0679	6.2	0.06266	4.3	0.72	751	32	738	33	697	92	108
a56	4798	39	5	0.39	2261	0.11303	8.8	0.8944	11.3	0.05739	7.1	0.78	690	58	649	56	506	157	136
a57	3163	46	3	0.57	4682	0.06539	8.1	0.6161	12.5	0.06833	9.5	0.65	408	32	487	50	879	198	46
a58	15018	24	10	0.48	5852	0.37962	6.5	5.5256	7.9	0.10557	4.4	0.83	2075	117	1905	70	1724	80	120
a59	5009	79	3	0.29	2102	0.04072	6.6	0.3430	9.6	0.06109	7.0	0.69	257	17	299	25	642	150	40
a60	5319	55	4	0.11	9365	0.07956	4.6	0.6325	6.6	0.05766	4.7	0.70	494	22	498	26	517	104	96
b1	1297	60	3	0.17	2361	0.04511	6.5	0.3448	9.5	0.05543	6.9	0.68	284	18	301	25	430	154	66
b2	1888	115	5	0.51	3600	0.04188	3.0	0.3058	5.9	0.05294	5.1	0.51	265	8	271	14	326	115	81
b3	14475	362	31	0.25	1547	0.08478	5.4	0.7369	6.8	0.06303	4.2	0.79	525	27	561	30	709	90	74
b4	5196	259	14	0.03	9728	0.05934	3.2	0.4434	4.5	0.05420	3.2	0.71	372	11	373	14	379	71	98
b5	15760	463	30	0.41	411	0.05617	3.5	0.7900	4.6	0.10201	3.0	0.77	352	12	591	21	1661	55	21
b6	1563	36	5	0.67	2100	0.11241	3.0	0.9686	6.1	0.06249	5.3	0.50	687	20	688	31	691	113	99
b7	5200	59	10	0.32	7082	0.16494	5.7	1.6887	6.9	0.07426	3.9	0.82	984	52	1004	45	1048	78	94
b8	1795	75	5	0.20	2898	0.06157	3.8	0.5311	5.5	0.06256	4.1	0.68	385	14	433	20	693	87	56
b9	2475	139	7	0.34	4602	0.05042	3.3	0.3767	5.7	0.05419	4.6	0.58	317	10	325	16	379	104	84
b10	3668	54	8	0.25	5063	0.15076	5.0	1.5200	6.9	0.07313	4.8	0.72	905	42	938	43	1017	98	89
b11	4163	193	12	0.17	1414	0.06406	4.7	0.5552	6.8	0.06286	5.0	0.68	400	18	448	25	703	106	57
b12	6518	95	18	0.23	9242	0.18151	4.7	1.8000	6.2	0.07192	4.1	0.75	1075	47	1045	41	984	83	109
b13	963	68	4	0.34	2050	0.04957	7.7	0.3270	11.6	0.04784	8.7	0.66	312	24	287	29	92	205	340
b14	6635	408	19	0.13	1133	0.04770	7.2	0.4200	11.5	0.06386	8.9	0.63	300	21	356	35	737	189	41
b15	4223	264	15	0.23	2642	0.05601	6.1	0.4142	7.4	0.05363	4.1	0.83	351	21	352	22	356	94	99
b16	5195	58	14	0.50	6355	0.21218	5.4	2.3951	7.4	0.08187	5.1	0.73	1240	61	1241	55	1242	100	100
b17	2370	117	8	0.11	4038	0.06960	3.7	0.5696	6.4	0.05935	5.2	0.59	434	16	458	24	580	112	75
b18	525	28	2	0.09	934	0.07375	6.2	0.5853	16.1	0.05756	14.9	0.39	459	28	468	62	513	327	89
b19	6683	72	20	0.31	1517	0.27866	5.3	3.3330	6.6	0.08675	4.0	0.80	1585	75	1489	53	1355	77	117
b20	1657	88	5	0.23	2542	0.05664	5.2	0.5210	9.7	0.06672	8.2	0.53	355	18	426	34	829	171	43
b21	2424	78	7	0.17	1714	0.08745	5.5	0.7351	8.2	0.06097	6.1	0.67	540	29	560	36	638	130	85
b22	3395	143	13	0.27	5720	0.09267	6.9	0.7579	8.6	0.05931	5.1	0.81	571	38	573	38	578	110	99
b23	5163	259	23	0.13	8532	0.09418	6.8	0.7827	8.2	0.06027	4.7	0.82	580	38	587	37	613	101	95
b24	978	8	4	1.98	1053	0.28796	7.8	3.7835	10.9	0.09529	7.6	0.72	1631	114	1589	91	1534	143	106
b25	13807	83	34	0.10	6445	0.41299	6.2	6.9155	7.3	0.12145	3.9	0.84	2229	118	2101	67	1978	70	113
b26	1997	170	10	0.28	3756	0.05740	4.9	0.4280	7.1	0.05407	5.2	0.69	360	17	362	22	374	116	96
b27	1957	74	9	0.60	3009	0.09977	7.9	0.8947	9.7	0.06504	5.7	0.81	613	46	649	48	776	120	79
b28	4682	196	27	0.56	7773	0.12351	4.4	1.0375	5.6	0.06092	3.4	0.78	751	31	723	29	636	74	118

Table 1 — aSk 2-2 (Sandstone e, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	^{206}Pb/^{204}Pb	^{206}Pb/^{238}U[c]	2 σ	^{207}Pb/^{235}U[c]	2 σ	^{207}Pb/^{206}Pb[e]	2 σ	Rho[d]	^{206}Pb/^{238}U	2 σ	^{207}Pb/^{235}U	2 σ	^{207}Pb/^{206}Pb	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b29	*5280*	*234*	*22*	*0.35*	*3702*	*0.08525*	*7.0*	*0.7362*	*8.6*	*0.06263*	*5.0*	*0.82*	*527*	*36*	*560*	*38*	*696*	*106*	*76*
b30	1472	21	6	0.47	609	0.23840	4.4	2.7726	8.5	0.08435	7.3	0.51	1378	55	1348	66	1301	142	106
c1	7846	59	11	0.36	11096	0.17496	1.9	1.7315	3.3	0.07178	2.7	0.58	1039	18	1020	22	980	55	106
c2	12985	242	21	0.27	22668	0.08342	2.1	0.6659	3.0	0.05789	2.1	0.69	517	10	518	12	526	47	98
c3	2567	75	4	0.41	4859	0.05573	2.0	0.4081	4.5	0.05311	4.0	0.45	350	7	348	13	334	91	105
c4	8202	60	12	0.64	11443	0.17908	1.8	1.7917	3.0	0.07256	2.4	0.59	1062	17	1042	20	1002	49	106
c5	*6304*	*167*	*11*	*0.33*	*2848*	*0.06049*	*2.2*	*0.4955*	*3.5*	*0.05941*	*2.7*	*0.62*	*379*	*8*	*409*	*12*	*582*	*59*	*65*
c6	10407	28	11	0.98	10286	0.30813	1.8	4.3545	2.8	0.10250	2.1	0.66	1731	28	1704	23	1670	39	104
c7	4195	45	6	0.17	6469	0.13801	2.0	1.2494	4.2	0.06566	3.7	0.48	833	16	823	24	796	77	105
c8	*11734*	*49*	*8*	*0.32*	*3389*	*0.12536*	*2.3*	*2.3909*	*3.7*	*0.13832*	*2.9*	*0.63*	*761*	*17*	*1240*	*27*	*2206*	*50*	*35*
c9	*6927*	*43*	*10*	*0.35*	*9466*	*0.21295*	*1.2*	*2.1743*	*3.2*	*0.07405*	*2.9*	*0.39*	*1245*	*14*	*1173*	*22*	*1043*	*59*	*119*
c10	13461	414	21	0.10	20360	0.05313	2.1	0.3923	2.9	0.05356	2.1	0.72	334	7	336	8	352	47	95
c11	3159	44	6	1.18	3802	0.10573	1.4	0.8916	4.1	0.06116	3.9	0.35	648	9	647	20	645	83	100
c12	50052	184	58	0.64	4893	0.26990	3.3	3.6489	5.2	0.09805	4.0	0.63	1540	45	1560	42	1587	76	97
c13	58109	262	69	0.29	2325	0.25266	2.4	3.1477	2.8	0.09036	1.6	0.84	1452	31	1444	22	1433	30	101
c14	3469	33	5	0.65	5237	0.14224	3.2	1.3086	5.8	0.06673	4.8	0.56	857	26	850	34	829	101	103
c15	6513	25	7	0.29	7454	0.25798	1.8	3.1518	3.8	0.08861	3.3	0.48	1479	24	1445	30	1396	63	106
c16	*1669*	*6*	*1*	*0.29*	*1753*	*0.21268*	*3.1*	*2.8415*	*7.5*	*0.09690*	*6.8*	*0.42*	*1243*	*35*	*1367*	*58*	*1565*	*128*	*79*
c17	8752	38	10	0.50	10194	0.23789	2.0	2.8482	3.5	0.08683	2.9	0.58	1376	25	1368	27	1357	56	101
c18	*33920*	*104*	*32*	*0.88*	*4541*	*0.23115*	*3.4*	*3.2929*	*3.8*	*0.10332*	*1.7*	*0.90*	*1341*	*41*	*1479*	*30*	*1685*	*31*	*80*
c19	15293	51	18	1.09	16828	0.26949	1.2	3.4184	2.4	0.09200	2.1	0.49	1538	16	1509	19	1467	40	105
c20	7514	112	12	0.29	4976	0.10279	2.3	0.8505	4.1	0.06001	3.4	0.57	631	14	625	19	604	73	104
c21	*8563*	*79*	*9*	*0.85*	*201*	*0.08177*	*2.5*	*1.5941*	*11.4*	*0.14139*	*11.2*	*0.22*	*507*	*12*	*968*	*74*	*2244*	*193*	*23*
c22	41568	117	38	0.32	41000	0.30401	1.7	4.2930	2.2	0.10242	1.3	0.80	1711	26	1692	18	1668	24	103
c23	11917	34	12	0.64	12142	0.29925	2.3	4.1015	3.4	0.09941	2.5	0.67	1688	34	1655	28	1613	46	105
c24	5074	63	8	0.71	8441	0.10901	2.0	0.9192	3.0	0.06115	2.2	0.68	667	13	662	15	645	47	103
c25	3092	89	6	0.49	5767	0.05948	2.4	0.4477	4.1	0.05459	3.3	0.59	372	9	376	13	395	75	94
c26	*4221*	*95*	*6*	*0.34*	*880*	*0.05528*	*2.3*	*0.5274*	*6.7*	*0.06920*	*6.3*	*0.34*	*347*	*8*	*430*	*24*	*905*	*129*	*38*
c27	32408	83	30	0.49	7473	0.31452	2.1	4.5725	3.1	0.10544	2.2	0.70	1763	33	1744	26	1722	40	102
c28	10603	42	11	0.36	12026	0.24292	2.7	2.9898	3.9	0.08927	2.8	0.68	1402	34	1405	30	1410	54	99
c29	8954	83	12	0.30	13425	0.14400	1.2	1.3397	2.7	0.06748	2.5	0.43	867	9	863	16	852	51	102
c30	*698*	*7*	*1*	*0.66*	*1026*	*0.11833*	*3.1*	*1.1331*	*7.0*	*0.06945*	*6.2*	*0.44*	*721*	*21*	*769*	*38*	*912*	*129*	*79*

Table 1 — Sk 3-1 (Sandstone d, Schrammstein Formation, Lower Coniacium) — 50° 54′ 31″ N; 14° 14′ 16.5″ E, measured single zircon grains: 115, concordant within 90 – 110% of concordance: 46

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a1	2015	122	6	0.51	3807	0.04895	3.9	0.3535	6.8	0.05238	5.6	0.57	308	12	307	18	302	127	102
a2	2583	15	5	0.71	2674	0.29836	3.8	4.0512	6.4	0.09848	5.2	0.59	1683	56	1645	53	1596	96	105
a3	*6448*	*251*	*18*	*0.41*	*11193*	*0.07228*	*2.2*	*0.5786*	*3.4*	*0.05805*	*2.6*	*0.66*	*450*	*10*	*464*	*13*	*532*	*56*	*85*
a4	2107	97	7	0.59	3837	0.06866	2.5	0.5239	4.7	0.05534	4.0	0.52	428	10	428	17	426	90	101
a5	*442*	*23*	*1*	*0.56*	*797*	*0.05431*	*4.5*	*0.4182*	*9.1*	*0.05585*	*8.0*	*0.49*	*341*	*15*	*355*	*28*	*446*	*177*	*76*
a6	*3003*	*135*	*7*	*0.26*	*964*	*0.05108*	*3.4*	*0.4839*	*7.5*	*0.06870*	*6.7*	*0.45*	*321*	*11*	*401*	*25*	*890*	*138*	*36*
a8	1487	49	5	0.56	2479	0.09038	3.0	0.7433	5.5	0.05964	4.6	0.54	558	16	564	24	591	101	94
a9	1100	63	3	0.43	2111	0.05135	3.3	0.3718	6.5	0.05251	5.6	0.51	323	10	321	18	308	127	105
a11	*8250*	*404*	*21*	*0.45*	*1997*	*0.05000*	*2.1*	*0.4371*	*6.5*	*0.06340*	*6.1*	*0.33*	*315*	*7*	*368*	*20*	*722*	*130*	*44*
a12	*2421*	*106*	*7*	*0.32*	*1338*	*0.06970*	*3.2*	*0.5737*	*6.8*	*0.05970*	*5.9*	*0.48*	*434*	*14*	*460*	*25*	*593*	*129*	*73*
a13	*1065*	*63*	*4*	*0.58*	*2069*	*0.05499*	*1.8*	*0.3930*	*5.4*	*0.05183*	*5.1*	*0.33*	*345*	*6*	*337*	*15*	*278*	*116*	*124*
a14	*1304*	*81*	*4*	*0.55*	*2304*	*0.05286*	*2.2*	*0.3788*	*5.4*	*0.05197*	*5.0*	*0.40*	*332*	*7*	*326*	*15*	*284*	*114*	*117*
a15	*986*	*55*	*3*	*0.69*	*1825*	*0.04159*	*3.7*	*0.3118*	*8.6*	*0.05437*	*7.7*	*0.44*	*263*	*10*	*276*	*21*	*386*	*173*	*68*
a16	3532	94	12	1.26	5906	0.10798	2.8	0.9194	5.3	0.06175	4.5	0.53	661	18	662	26	666	96	99
a17	*1686*	*101*	*6*	*0.99*	*1476*	*0.05350*	*3.6*	*0.4034*	*6.4*	*0.05469*	*5.4*	*0.56*	*336*	*12*	*344*	*19*	*400*	*120*	*84*
a18	2638	154	8	0.31	2966	0.05558	2.0	0.4122	4.7	0.05379	4.3	0.43	349	7	350	14	362	96	96
a19	*1492*	*69*	*4*	*0.44*	*748*	*0.05589*	*4.2*	*0.5230*	*10.7*	*0.06786*	*9.8*	*0.39*	*351*	*14*	*427*	*38*	*864*	*203*	*41*
a20	*15452*	*83*	*42*	*0.91*	*11914*	*0.46434*	*6.4*	*7.2012*	*9.7*	*0.11248*	*7.2*	*0.67*	*2459*	*133*	*2137*	*90*	*1840*	*130*	*134*
a21	*2117*	*65*	*4*	*0.30*	*301*	*0.06065*	*4.3*	*0.7238*	*13.3*	*0.08656*	*12.5*	*0.33*	*380*	*16*	*553*	*58*	*1351*	*242*	*28*
a22	*5727*	*202*	*12*	*0.27*	*282*	*0.05290*	*2.2*	*0.7365*	*3.3*	*0.10097*	*2.5*	*0.66*	*332*	*7*	*560*	*14*	*1642*	*46*	*20*
a23	3398	128	10	0.41	3440	0.07652	4.5	0.6045	6.2	0.05730	4.3	0.72	475	20	480	24	503	95	94
a24	*1387*	*82*	*5*	*0.57*	*2497*	*0.05383*	*2.1*	*0.4210*	*6.9*	*0.05672*	*6.6*	*0.30*	*338*	*7*	*357*	*21*	*481*	*145*	*70*
a25	803	53	3	1.68	1536	0.04969	2.9	0.3606	6.7	0.05263	6.0	0.43	313	9	313	18	313	137	100
a26	*1581*	*80*	*5*	*0.42*	*2399*	*0.05723*	*3.0*	*0.5294*	*10.4*	*0.06708*	*9.9*	*0.29*	*359*	*11*	*431*	*37*	*840*	*206*	*43*
a27	*2754*	*79*	*8*	*1.20*	*1270*	*0.08993*	*3.3*	*0.8872*	*5.1*	*0.07155*	*3.9*	*0.65*	*555*	*18*	*645*	*25*	*973*	*79*	*57*
a28	1256	74	4	0.68	2262	0.05660	2.3	0.4171	5.1	0.05345	4.5	0.45	355	8	354	15	348	103	102
a29	1911	80	6	0.31	849	0.07540	2.6	0.5920	10.9	0.05694	10.5	0.24	469	12	472	42	489	233	96
a30	807	26	3	0.48	1337	0.09441	2.6	0.7836	8.3	0.06019	7.9	0.31	582	15	588	38	611	171	95
a31	*4145*	*263*	*14*	*0.48*	*3432*	*0.05363*	*1.8*	*0.4214*	*6.6*	*0.05698*	*6.4*	*0.27*	*337*	*6*	*357*	*20*	*491*	*140*	*69*
a32	*2385*	*130*	*9*	*0.35*	*4192*	*0.07276*	*3.0*	*0.5808*	*6.8*	*0.05789*	*6.1*	*0.44*	*453*	*13*	*465*	*26*	*526*	*135*	*86*
a33	4694	242	18	0.13	7717	0.07789	4.1	0.6223	6.8	0.05795	5.4	0.60	484	19	491	27	528	119	92
a34	3735	183	12	0.26	2065	0.06871	2.7	0.5292	3.7	0.05586	2.5	0.73	428	11	431	13	447	56	96
a35	2901	196	11	0.35	1267	0.05636	2.9	0.4149	7.3	0.05339	6.7	0.39	353	10	352	22	345	153	102
a36	*625*	*39*	*2*	*1.19*	*1070*	*0.05396*	*2.8*	*0.4380*	*8.2*	*0.05887*	*7.7*	*0.34*	*339*	*9*	*369*	*26*	*562*	*168*	*60*
a37	*876*	*52*	*3*	*0.52*	*1559*	*0.04949*	*4.6*	*0.3798*	*8.3*	*0.05566*	*7.0*	*0.55*	*311*	*14*	*327*	*24*	*439*	*155*	*71*
a38	*1969*	*117*	*8*	*1.80*	*3657*	*0.05178*	*3.2*	*0.3873*	*5.7*	*0.05424*	*4.7*	*0.56*	*325*	*10*	*332*	*16*	*381*	*106*	*85*

Table 1 — Sk 3-1 (Sandstone d, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a39	11541	580	30	0.13	2985	0.05460	3.1	0.4513	6.1	0.05996	5.3	0.51	343	10	378	20	602	114	57
a40	9499	48	16	0.48	9466	0.32960	3.4	4.5927	4.5	0.10106	2.9	0.76	1836	55	1748	38	1644	54	112
a41	4161	144	11	0.11	7515	0.07989	2.3	0.6147	4.7	0.05580	4.1	0.49	495	11	486	18	444	91	112
a42	4839	161	12	0.19	8804	0.07762	3.8	0.5933	5.8	0.05543	4.4	0.65	482	18	473	22	430	99	112
a44	477	18	1	0.01	810	0.06046	2.8	0.4953	12.9	0.05941	12.6	0.22	378	10	409	44	582	273	65
a45	4786	141	8	0.21	531	0.05365	3.0	0.5899	6.6	0.07973	5.9	0.45	337	10	471	25	1190	117	28
a46	4893	88	10	0.65	8145	0.10381	2.5	0.8672	3.4	0.06059	2.3	0.73	637	15	634	16	625	50	102
a47	800	12	2	0.98	1280	0.11349	3.0	0.9821	7.4	0.06276	6.8	0.40	693	20	695	38	700	145	99
a48	2130	71	4	0.57	1391	0.05812	2.3	0.4674	4.9	0.05833	4.3	0.47	364	8	389	16	542	95	67
a49	1504	49	3	0.77	2106	0.06152	3.4	0.4770	9.3	0.05623	8.7	0.37	385	13	396	31	462	192	83
a50	1247	42	2	0.13	2491	0.05851	3.1	0.4089	6.0	0.05068	5.2	0.51	367	11	348	18	227	120	162
a51	2034	53	3	0.11	1343	0.05991	2.5	0.5430	10.8	0.06574	10.5	0.23	375	9	440	39	798	220	47
a52	2749	82	4	0.07	5146	0.05546	2.4	0.4111	4.8	0.05376	4.2	0.50	348	8	350	14	361	94	96
a53	1484	44	3	0.50	1607	0.05727	3.3	0.4233	5.3	0.05361	4.1	0.62	359	11	358	16	354	93	101
a54	2368	81	4	0.14	4844	0.05008	3.8	0.3484	15.2	0.05045	14.7	0.25	315	12	304	41	216	341	146
a55	1312	33	2	0.09	2373	0.06048	3.4	0.4654	5.3	0.05582	4.0	0.65	379	13	388	17	445	89	85
a56	3604	103	6	0.36	6584	0.05471	4.2	0.4150	9.8	0.05502	8.8	0.43	343	14	352	30	413	197	83
a57	4353	54	4	0.13	969	0.07840	7.8	0.7591	23.1	0.07023	21.7	0.34	487	37	573	107	935	446	52
a58	3112	12	4	0.42	2121	0.32269	3.8	3.8980	6.3	0.08761	4.9	0.61	1803	61	1613	52	1374	95	131
a59	3304	42	5	0.46	5310	0.11005	3.1	0.9553	5.3	0.06296	4.3	0.59	673	20	681	27	707	92	95
a60	8211	41	10	1.28	4538	0.19705	4.3	2.1101	6.1	0.07767	4.3	0.71	1159	46	1152	43	1138	85	102
b1	20861	61	25	1.54	5958	0.31611	2.8	4.7399	3.2	0.10875	1.5	0.89	1771	44	1774	27	1779	27	100
b2	36544	193	50	0.39	24410	0.25191	3.3	3.0420	3.8	0.08758	1.9	0.87	1448	43	1418	30	1373	36	105
b3	2528	10	3	1.53	2739	0.25128	2.8	3.2363	5.8	0.09341	5.1	0.48	1445	36	1466	46	1496	96	97
b4	5713	165	10	0.32	1153	0.06051	2.3	0.5682	3.3	0.06811	2.3	0.70	379	9	457	12	872	48	43
b5	6348	244	13	0.09	5183	0.05505	4.4	0.4063	6.8	0.05353	5.2	0.64	345	15	346	20	351	117	98
b7	2826	102	5	0.03	5299	0.05870	3.4	0.4364	5.5	0.05393	4.3	0.62	368	12	368	17	368	98	100
b8	6155	175	13	0.50	11200	0.07124	2.2	0.5443	3.1	0.05541	2.2	0.70	444	9	441	11	429	50	103
b9	2248	79	5	0.48	1900	0.05930	2.8	0.5111	7.8	0.06250	7.3	0.35	371	10	419	27	691	155	54
b10	2655	62	5	0.50	4578	0.07843	2.2	0.6353	3.8	0.05874	3.1	0.59	487	11	499	15	558	67	87
b11	8389	45	12	1.07	9247	0.22890	2.9	2.8906	3.8	0.09159	2.5	0.76	1329	35	1379	29	1459	48	91
b12	1289	48	3	0.16	2424	0.05618	2.7	0.4175	5.7	0.05391	5.1	0.47	352	9	354	17	367	114	96
b13	7672	298	15	0.29	2210	0.05148	3.1	0.4202	5.1	0.05920	4.1	0.60	324	10	356	16	574	89	56
b14	5570	150	12	0.13	9401	0.08220	2.3	0.6863	4.6	0.06055	3.9	0.51	509	11	531	19	623	85	82
b15	2533	107	6	0.68	2617	0.05651	2.6	0.4284	7.2	0.05498	6.7	0.36	354	9	362	22	411	150	86
b16	5909	117	11	0.30	9865	0.09814	2.9	0.8175	3.8	0.06042	2.5	0.76	603	17	607	18	619	53	98

Table 1 — Sk 3-1 (Sandstone d, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b17	3577	150	8	0.30	3436	0.05112	3.0	0.4000	4.8	0.05675	3.7	0.63	321	9	342	14	482	82	67
b18	2948	62	4	0.60	370	0.06029	3.4	0.7382	11.9	0.08881	11.3	0.29	377	13	561	52	1400	217	27
b19	14331	202	22	0.07	9308	0.11370	4.4	1.1126	5.4	0.07097	3.0	0.82	694	29	759	29	957	62	73
b20	2337	99	7	1.16	1628	0.05661	3.3	0.4206	5.8	0.05388	4.8	0.57	355	11	356	18	366	108	97
b21	3280	147	8	0.32	5667	0.05258	2.4	0.3838	4.1	0.05293	3.4	0.58	330	8	330	12	326	76	101
b22	28286	113	39	0.08	11434	0.35940	2.2	4.9767	3.6	0.10043	2.8	0.61	1979	37	1815	30	1632	52	121
b23	4247	123	9	0.15	1058	0.07172	2.4	0.5877	7.0	0.05943	6.6	0.34	447	10	469	27	583	143	77
b24	2385	103	5	0.03	2952	0.05516	2.7	0.4058	4.6	0.05335	3.7	0.60	346	9	346	14	344	83	101
b26	1091	49	3	0.99	608	0.05340	3.7	0.3914	10.1	0.05317	9.4	0.37	335	12	335	29	336	213	100
b27	1108	46	3	0.56	1294	0.05322	2.9	0.3893	5.9	0.05306	5.1	0.49	334	9	334	17	331	116	101
b28	3058	133	8	0.85	5517	0.05292	2.4	0.4082	4.3	0.05594	3.6	0.55	332	8	348	13	450	80	74
b29	4743	83	8	0.44	308	0.08423	3.2	1.2081	5.5	0.10402	4.5	0.59	521	16	804	31	1697	82	31
b30	881	40	2	0.79	496	0.05740	2.9	0.4271	5.5	0.05397	4.6	0.54	360	10	361	17	370	103	97
b31	3843	177	10	0.37	7215	0.05561	2.2	0.4126	3.9	0.05381	3.2	0.56	349	7	351	12	363	73	96
b32	2250	56	5	0.26	3807	0.09124	2.6	0.7502	5.4	0.05963	4.7	0.49	563	14	568	24	590	101	95
b33	6116	291	16	0.35	6359	0.05388	2.7	0.4048	3.7	0.05448	2.6	0.72	338	9	345	11	391	58	87
b34	4809	112	11	0.27	8099	0.10287	2.0	0.8498	3.2	0.05991	2.5	0.62	631	12	625	15	600	54	105
b35	5112	254	13	0.13	3554	0.05396	5.5	0.4105	6.8	0.05517	4.0	0.80	339	18	349	20	419	90	81
b36	12254	61	21	0.89	11758	0.31263	2.4	4.5251	3.3	0.10498	2.2	0.73	1754	37	1736	28	1714	41	102
b37	16535	75	26	0.51	13237	0.33403	2.3	4.7573	3.1	0.10330	2.1	0.73	1858	37	1777	27	1684	39	110
b38	4557	201	11	0.19	5287	0.05556	3.1	0.4095	4.4	0.05346	3.2	0.69	349	10	349	13	349	71	100
b39	7762	45	18	0.44	8403	0.39391	2.3	5.0711	4.5	0.09337	3.8	0.52	2141	42	1831	39	1495	72	143
b40	2097	82	4	0.34	1809	0.05573	3.1	0.4109	5.4	0.05347	4.4	0.58	350	11	350	16	349	99	100
b41	4323	127	9	0.30	7689	0.07459	3.3	0.5838	3.9	0.05676	2.2	0.83	464	15	467	15	482	49	96
b42	6522	113	10	0.46	315	0.07984	2.2	1.1290	6.7	0.10256	6.3	0.33	495	11	767	37	1671	117	30
b43	3213	120	7	0.44	5972	0.06002	1.6	0.4495	3.9	0.05432	3.5	0.41	376	6	377	12	384	79	98
b44	2849	96	5	0.35	1713	0.05605	2.4	0.4780	8.2	0.06186	7.8	0.29	352	8	397	27	669	168	53
b45	5597	117	9	0.14	2153	0.07877	3.6	0.6918	5.2	0.06370	3.7	0.70	489	17	534	22	732	79	67
b46	2279	75	4	0.45	1143	0.05145	2.7	0.3878	5.0	0.05466	4.2	0.53	323	8	333	14	399	95	81
b47	1725	74	3	0.59	3165	0.04071	3.1	0.3087	6.7	0.05500	6.0	0.46	257	8	273	16	412	134	62
b48	14449	30	5	0.90	1151	0.12405	5.2	2.3142	6.5	0.13530	3.9	0.80	754	37	1217	47	2168	68	35
b49	3993	113	6	0.38	4656	0.05133	2.5	0.4124	5.1	0.05827	4.5	0.48	323	8	351	15	540	99	60
b50	4384	68	6	0.82	1019	0.07910	2.6	0.8382	4.5	0.07686	3.7	0.57	491	12	618	21	1118	75	44
b51	5332	81	6	0.51	478	0.06785	2.8	0.8165	4.8	0.08727	3.9	0.58	423	12	606	22	1367	76	31
b52	1190	31	2	0.66	1949	0.05486	3.1	0.4059	5.0	0.05366	4.0	0.61	344	10	346	15	357	90	96
b54	1481	25	2	0.44	2704	0.08385	2.8	0.6406	5.6	0.05541	4.8	0.50	519	14	503	22	429	107	121

Table 1 — Sk 3-1 (Sandstone d, Schrammstein Formation, Lower Coniacium) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b55	2170	53	3	0.03	3937	0.05731	2.6	0.4387	4.8	0.05551	4.0	0.54	359	9	369	15	433	90	83
b56	2082	53	3	0.20	1731	0.05516	3.2	0.4244	6.5	0.05581	5.6	0.49	346	11	359	20	445	126	78
b57	2834	43	4	0.31	4859	0.08230	3.6	0.6699	6.0	0.05903	4.8	0.60	510	18	521	25	568	104	90
b58	2687	68	4	0.58	5203	0.05938	2.0	0.4285	4.6	0.05234	4.2	0.43	372	7	362	14	300	95	124
b59	4755	69	6	0.52	2158	0.08388	2.9	0.6995	6.0	0.06048	5.2	0.49	519	15	539	25	621	113	84
b60	1461	31	2	1.06	2514	0.05262	3.8	0.4168	7.9	0.05745	6.9	0.48	331	12	354	24	509	152	65

Table 1 — Sk 4-1 (Sandstone c, Postelwitz Formation, Upper Turonian) — 50° 54′ 31.5″ N; 14° 14′ 17.1″ E, measured single zircon grains: 116, concordant within 90–110% of concordance: 67

					Isotope ratios[c]								Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a1	688	33	2	1.27	1093	0.04979	3.6	0.3684	8.2	0.05366	7.4	0.43	313	11	318	23	357	167	88
a2	2857	137	7	0.11	4716	0.05583	2.8	0.4132	4.7	0.05367	3.8	0.60	350	10	351	14	357	85	98
a3	1442	69	4	0.27	2722	0.05466	3.1	0.4005	5.5	0.05314	4.5	0.57	343	10	342	16	335	102	103
a5	1513	73	4	0.20	2832	0.05778	2.9	0.4264	5.2	0.05352	4.3	0.55	362	10	361	16	351	98	103
a6	815	29	2	0.66	1297	0.07635	3.6	0.5809	7.3	0.05518	6.4	0.49	474	16	465	28	420	143	113
a7	8734	41	15	0.82	8575	0.30670	3.2	4.3116	4.3	0.10196	2.8	0.75	1724	49	1696	36	1660	52	104
a8	3326	175	10	0.34	6208	0.05696	2.7	0.4221	4.5	0.05374	3.6	0.59	357	9	358	14	360	82	99
a9	2333	111	7	0.21	3952	0.06264	2.4	0.5115	5.3	0.05922	4.7	0.45	392	9	419	18	575	102	68
a10	3048	159	9	0.22	5728	0.05640	3.0	0.4149	5.0	0.05336	3.9	0.61	354	10	352	15	344	89	103
a11	1074	52	4	1.02	1865	0.06349	2.5	0.5046	9.1	0.05765	8.7	0.28	397	10	415	31	516	192	77
a12	5787	191	17	0.12	9886	0.09556	2.7	0.7787	4.1	0.05910	3.1	0.65	588	15	585	18	571	67	103
a13	1238	66	4	0.87	1936	0.05801	2.2	0.4199	6.0	0.05249	5.6	0.37	364	8	356	18	307	126	118
a14	1066	56	4	1.15	2048	0.05780	3.5	0.4188	7.8	0.05256	6.9	0.45	362	12	355	24	310	158	117
a15	5799	154	14	0.25	5343	0.09116	3.1	0.7535	4.2	0.05995	2.8	0.75	562	17	570	18	602	60	93
a16	1502	74	4	0.07	2785	0.05664	3.4	0.4222	5.8	0.05406	4.6	0.59	355	12	358	18	374	105	95
a17	33722	115	46	0.57	10666	0.35805	4.0	6.4355	4.7	0.13036	2.4	0.86	1973	69	2037	42	2103	43	94
a18	1778	97	5	0.43	1607	0.05489	3.7	0.4031	6.3	0.05326	5.1	0.59	344	12	344	18	340	115	101
a19	10220	565	27	0.13	1299	0.04963	3.2	0.4262	7.3	0.06228	6.5	0.44	312	10	360	22	684	139	46
a20	3503	49	9	0.50	5068	0.17143	3.2	1.6377	4.6	0.06928	3.3	0.70	1020	31	985	29	907	67	112

Table 1 — Sk 4-1 (Sandstone c, Postelwitz Formation, Upper Turonian) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	^{206}Pb/^{204}Pb	^{206}Pb/^{238}U[c]	2 σ	^{207}Pb/^{235}U[c]	2 σ	^{207}Pb/^{206}Pb[e]	2 σ	Rho[d]	^{206}Pb/^{238}U	2 σ	^{207}Pb/^{235}U	2 σ	^{207}Pb/^{206}Pb	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a21	743	40	2	0.12	1371	0.05816	3.3	0.4360	7.7	0.05438	7.0	0.43	364	12	367	24	387	157	94
a22	3455	196	11	0.13	3387	0.05785	2.7	0.4194	4.0	0.05258	2.9	0.68	363	10	356	12	311	66	117
a23	1159	68	4	0.97	2202	0.05115	3.6	0.3716	6.2	0.05269	5.1	0.58	322	11	321	17	315	116	102
a24	7880	332	22	0.12	13357	0.06846	2.9	0.5573	3.8	0.05904	2.4	0.77	427	12	450	14	569	52	75
a25	1288	72	4	0.42	2380	0.05517	3.2	0.4096	6.6	0.05385	5.7	0.49	346	11	349	20	365	129	95
a26	1796	99	6	0.33	3335	0.05618	3.2	0.4174	5.5	0.05389	4.4	0.58	352	11	354	17	366	100	96
a27	3421	201	10	0.11	6485	0.05412	2.7	0.3950	4.7	0.05293	3.8	0.57	340	9	338	14	326	87	104
a28	6056	360	20	0.18	6852	0.05695	4.1	0.4169	5.8	0.05309	4.0	0.72	357	14	354	17	333	91	107
a29	9792	388	28	0.05	5759	0.07866	4.3	0.6203	5.5	0.05719	3.4	0.78	488	20	490	22	499	76	98
a30	5254	194	16	0.25	6433	0.08222	2.8	0.6599	3.9	0.05822	2.8	0.72	509	14	515	16	538	60	95
a31	1765	100	6	0.86	3346	0.05474	3.7	0.3989	5.1	0.05286	3.5	0.73	344	12	341	15	323	79	106
a32	1446	52	4	0.75	2366	0.07357	2.8	0.6224	5.8	0.06136	5.1	0.48	458	12	491	23	652	109	70
a33	12082	109	24	0.31	3508	0.20542	2.5	3.1770	3.6	0.11217	2.6	0.70	1204	28	1452	28	1835	47	66
a34	3460	221	11	0.26	1168	0.05181	4.3	0.4205	6.1	0.05886	4.3	0.71	326	14	356	19	562	94	58
a35	1924	118	6	0.28	3498	0.05123	3.4	0.3889	5.5	0.05506	4.3	0.63	322	11	334	16	415	96	78
a36	9918	629	26	0.35	649	0.03740	4.2	0.4193	5.2	0.08132	3.0	0.82	237	10	356	16	1229	59	19
a37	1395	116	5	0.64	1310	0.04100	3.6	0.2990	6.3	0.05290	5.2	0.56	259	9	266	15	324	118	80
a38	1538	86	5	0.74	2885	0.05295	2.5	0.3893	4.7	0.05332	3.9	0.54	333	8	334	13	342	89	97
a39	2613	134	7	0.37	4914	0.05536	3.1	0.4076	4.4	0.05339	3.2	0.69	347	10	347	13	346	72	101
a40	3192	154	8	0.13	5903	0.05796	3.3	0.4296	5.5	0.05376	4.4	0.60	363	12	363	17	361	99	101
a41	13154	74	21	0.60	10754	0.24065	3.8	3.8510	5.3	0.11606	3.7	0.71	1390	47	1603	44	1896	67	73
a42	1891	86	5	0.55	2189	0.05199	2.5	0.3806	4.3	0.05310	3.5	0.58	327	8	328	12	333	79	98
a43	1141	51	3	0.88	2066	0.05375	3.9	0.3948	6.4	0.05327	5.1	0.61	337	13	338	19	340	115	99
a44	4797	195	11	0.21	7391	0.05695	2.9	0.4215	4.3	0.05368	3.2	0.68	357	10	357	13	358	71	100
a45	1660	61	3	0.47	1373	0.05476	3.4	0.4198	5.7	0.05561	4.5	0.61	344	12	356	17	437	100	79
a46	1925	73	4	0.45	3538	0.05593	3.0	0.4206	5.4	0.05454	4.5	0.56	351	10	356	16	393	100	89
a47	1921	56	4	0.21	3334	0.07127	2.4	0.5715	5.5	0.05815	5.0	0.44	444	10	459	21	536	109	83
a48	604	20	1	0.14	1124	0.05863	3.6	0.4369	8.9	0.05404	8.2	0.40	367	13	368	28	373	184	99
a49	1132	39	2	0.93	2115	0.05192	2.9	0.3830	5.7	0.05351	4.9	0.50	326	9	329	16	351	111	93
a50	2279	59	3	0.40	648	0.04954	7.7	0.5025	17.2	0.07357	15.4	0.45	312	23	413	60	1030	312	30
a51	14311	37	13	0.68	12723	0.30711	3.0	4.7779	3.8	0.11283	2.3	0.79	1726	45	1781	32	1846	42	94
a52	21321	26	15	1.33	13446	0.46194	3.9	10.1058	4.4	0.15867	2.0	0.89	2448	81	2445	42	2441	35	100
a53	669	19	2	2.00	1258	0.05736	3.4	0.4227	8.1	0.05345	7.3	0.42	360	12	358	25	348	166	103
a54	1959	30	3	0.31	3244	0.08951	3.1	0.7479	5.9	0.06060	5.0	0.52	553	16	567	26	625	108	88
a55	9184	303	10	0.18	627	0.03288	3.5	0.3486	5.2	0.07691	3.9	0.67	209	7	304	14	1119	78	19
a56	7651	14	6	1.19	3031	0.34657	3.0	5.6739	4.2	0.11874	2.9	0.72	1918	50	1927	37	1937	52	99

Table 1 — Sk 4-1 (Sandstone c, Postelwitz Formation, Upper Turonian) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a58	2217	56	3	0.35	4162	0.05501	3.5	0.4048	5.4	0.05337	4.0	0.66	345	12	345	16	345	91	100
a59	2278	39	3	1.04	4123	0.06989	3.1	0.5331	4.8	0.05532	3.6	0.66	436	13	434	17	425	80	102
a60	2424	58	3	0.44	4531	0.05571	3.5	0.4113	5.5	0.05354	4.2	0.64	350	12	350	16	352	94	99
b1	3412	91	7	0.84	6126	0.06817	2.9	0.5258	4.6	0.05594	3.6	0.63	425	12	429	16	450	79	94
b2	3012	118	7	0.77	4204	0.05499	2.6	0.4063	5.5	0.05359	4.9	0.47	345	9	346	16	354	110	97
b3	3020	121	6	0.21	3617	0.05373	2.4	0.4000	4.5	0.05399	3.8	0.53	337	8	342	13	370	86	91
b5	3665	89	8	0.47	6367	0.08708	2.5	0.6943	4.6	0.05782	3.9	0.54	538	13	535	19	523	85	103
b6	1454	53	3	0.02	2718	0.05568	2.9	0.4126	5.4	0.05375	4.6	0.53	349	10	351	16	360	103	97
b7	*8945*	*246*	*16*	*0.11*	*6596*	*0.06797*	*2.4*	*0.5496*	*4.1*	*0.05865*	*3.3*	*0.59*	*424*	*10*	*445*	*15*	*554*	*72*	*77*
b8	6257	255	14	0.22	11733	0.05774	2.8	0.4291	4.3	0.05389	3.2	0.66	362	10	363	13	367	73	99
b9	21470	87	28	0.70	20355	0.28702	4.9	4.1337	6.1	0.10445	3.6	0.80	1627	71	1661	52	1705	67	95
b10	*4988*	*188*	*11*	*0.22*	*8612*	*0.05904*	*2.0*	*0.4718*	*4.4*	*0.05796*	*3.9*	*0.45*	*370*	*7*	*392*	*14*	*528*	*86*	*70*
b11	*8612*	*360*	*22*	*0.34*	*2882*	*0.06135*	*2.1*	*0.4853*	*3.7*	*0.05738*	*3.0*	*0.57*	*384*	*8*	*402*	*12*	*506*	*66*	*76*
b12	*28641*	*188*	*39*	*0.61*	*32244*	*0.19027*	*2.9*	*2.3432*	*3.3*	*0.08932*	*1.6*	*0.87*	*1123*	*30*	*1225*	*24*	*1411*	*31*	*80*
b13	3035	137	7	0.21	4189	0.05037	2.4	0.3718	4.3	0.05354	3.6	0.56	317	7	321	12	352	81	90
b14	3290	144	8	0.40	6236	0.05209	2.6	0.3804	4.0	0.05297	3.0	0.66	327	8	327	11	327	68	100
b15	*3179*	*129*	*7*	*0.35*	*2388*	*0.05342*	*2.5*	*0.4360*	*4.5*	*0.05920*	*3.7*	*0.56*	*335*	*8*	*367*	*14*	*574*	*80*	*58*
b16	2388	97	5	0.19	4454	0.05642	2.9	0.4196	5.4	0.05394	4.5	0.54	354	10	356	16	369	102	96
b17	*379*	*17*	*1*	*0.32*	*689*	*0.05538*	*3.4*	*0.4229*	*9.2*	*0.05538*	*8.5*	*0.37*	*347*	*12*	*358*	*28*	*428*	*190*	*81*
b18	762	32	2	0.36	1421	0.05869	2.8	0.4352	6.2	0.05378	5.6	0.45	368	10	367	19	362	125	102
b19	897	36	2	0.15	1695	0.05636	2.8	0.4129	7.3	0.05313	6.8	0.38	353	10	351	22	334	154	106
b20	5271	147	12	0.52	9216	0.08006	2.8	0.6357	4.2	0.05759	3.2	0.67	496	13	500	17	514	69	97
b21	*1563*	*69*	*4*	*0.92*	*2646*	*0.05105*	*2.4*	*0.4162*	*6.0*	*0.05914*	*5.5*	*0.40*	*321*	*8*	*353*	*18*	*572*	*119*	*56*
b22	4232	125	11	0.47	7448	0.08735	2.4	0.6894	4.0	0.05724	3.2	0.59	540	12	532	17	501	71	108
b23	*7385*	*74*	*18*	*0.40*	*10300*	*0.24421*	*2.6*	*2.4201*	*4.8*	*0.07187*	*4.0*	*0.55*	*1409*	*34*	*1249*	*35*	*982*	*82*	*143*
b24	2239	49	5	0.63	3734	0.10328	2.8	0.8591	4.9	0.06033	4.1	0.57	634	17	630	23	615	88	103
b25	*3684*	*91*	*8*	*0.34*	*2815*	*0.09201*	*2.8*	*0.7764*	*4.5*	*0.06120*	*3.6*	*0.62*	*567*	*15*	*583*	*20*	*646*	*77*	*88*
b26	7933	175	20	0.65	13008	0.10489	2.3	0.8908	3.7	0.06159	2.9	0.62	643	14	647	18	660	63	97
b27	*2018*	*94*	*5*	*0.61*	*3681*	*0.05443*	*3.3*	*0.4161*	*5.6*	*0.05545*	*4.4*	*0.60*	*342*	*11*	*353*	*17*	*430*	*99*	*79*
b28	*5335*	*262*	*13*	*0.16*	*3028*	*0.05058*	*2.5*	*0.4154*	*4.2*	*0.05957*	*3.3*	*0.60*	*318*	*8*	*353*	*12*	*588*	*72*	*54*
b29	3739	177	9	0.12	6932	0.05648	2.6	0.4233	4.6	0.05435	3.8	0.55	354	9	358	14	386	86	92
b30	*1301*	*61*	*4*	*0.49*	*2307*	*0.05748*	*2.7*	*0.4469*	*5.9*	*0.05640*	*5.2*	*0.46*	*360*	*10*	*375*	*19*	*468*	*116*	*77*
b31	1459	70	4	1.08	2767	0.05406	3.2	0.3961	7.1	0.05314	6.4	0.45	339	10	339	21	335	145	101
b32	1955	102	6	0.76	1517	0.05346	2.4	0.3961	4.3	0.05374	3.6	0.56	336	8	339	12	360	81	93
b33	*5595*	*310*	*15*	*0.12*	*4631*	*0.05218*	*4.4*	*0.3962*	*6.1*	*0.05506*	*4.2*	*0.72*	*328*	*14*	*339*	*18*	*415*	*95*	*79*
b35	*22219*	*58*	*24*	*0.48*	*14283*	*0.37726*	*3.9*	*8.0732*	*5.5*	*0.15521*	*4.0*	*0.70*	*2063*	*69*	*2239*	*51*	*2404*	*67*	*86*

Table 1 — Sk 4-1 (Sandstone c, Postelwitz Formation, Upper Turonian) continued.

					Isotope ratios[c]							Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U^b	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b36	2706	142	8	0.22	5086	0.05681	2.9	0.4205	4.6	0.05369	3.6	0.62	356	10	356	14	358	82	100
b37	*848*	*41*	*3*	*0.68*	*1664*	*0.05966*	*2.3*	*0.4218*	*6.3*	*0.05128*	*5.8*	*0.37*	*374*	*8*	*357*	*19*	*253*	*134*	*148*
b38	3458	178	10	0.47	6584	0.05295	2.8	0.3846	4.4	0.05268	3.4	0.64	333	9	330	12	315	76	106
b39	*2051*	*92*	*6*	*0.66*	*3887*	*0.05732*	*2.8*	*0.4166*	*4.5*	*0.05272*	*3.6*	*0.61*	*359*	*10*	*354*	*14*	*317*	*81*	*113*
b40	6204	265	14	0.11	4866	0.05574	2.3	0.4165	3.6	0.05420	2.8	0.65	350	8	354	11	380	62	92
b41	*2715*	*83*	*7*	*0.41*	*3048*	*0.07814*	*2.4*	*0.5902*	*4.0*	*0.05478*	*3.1*	*0.61*	*485*	*11*	*471*	*15*	*403*	*70*	*120*
b42	*1139*	*41*	*3*	*1.28*	*1008*	*0.05790*	*2.8*	*0.4743*	*9.7*	*0.05941*	*9.3*	*0.29*	*363*	*10*	*394*	*32*	*582*	*203*	*62*
b43	3847	118	7	0.12	7001	0.06514	2.1	0.4997	4.5	0.05563	4.0	0.46	407	8	411	15	438	90	93
b44	1921	62	4	0.27	3469	0.06250	2.3	0.4744	4.8	0.05505	4.3	0.47	391	9	394	16	414	95	94
b45	1764	65	4	0.65	3305	0.05337	3.8	0.3902	6.7	0.05303	5.5	0.57	335	12	335	19	330	124	102
b46	*4324*	*77*	*7*	*0.29*	*7044*	*0.09656*	*3.2*	*0.8264*	*6.1*	*0.06207*	*5.2*	*0.52*	*594*	*18*	*612*	*28*	*677*	*112*	*88*
b47	*2354*	*73*	*4*	*0.69*	*4007*	*0.05312*	*2.2*	*0.4054*	*4.1*	*0.05536*	*3.4*	*0.54*	*334*	*7*	*346*	*12*	*427*	*76*	*78*
b48	*6503*	*141*	*11*	*0.51*	*11066*	*0.07585*	*3.7*	*0.6172*	*4.6*	*0.05902*	*2.8*	*0.80*	*471*	*17*	*488*	*18*	*568*	*60*	*83*
b49	1316	38	2	0.52	2483	0.05479	2.9	0.4040	5.4	0.05348	4.5	0.54	344	10	345	16	349	102	98
b50	797	23	1	0.80	1520	0.05501	4.5	0.4028	7.4	0.05310	5.9	0.61	345	15	344	22	333	133	104
b51	*10016*	*154*	*16*	*0.23*	*2891*	*0.10534*	*2.9*	*0.7983*	*8.4*	*0.05497*	*7.9*	*0.34*	*646*	*18*	*596*	*39*	*411*	*177*	*157*
b52	12162	32	11	1.19	12047	0.27575	3.9	3.8486	4.6	0.10122	2.3	0.87	1570	55	1603	37	1647	42	95
b53	*5282*	*92*	*7*	*0.04*	*6306*	*0.07991*	*2.2*	*0.6622*	*4.0*	*0.06010*	*3.3*	*0.56*	*496*	*11*	*516*	*16*	*607*	*72*	*82*
b54	2325	3	2	1.58	1832	0.36791	6.4	6.4633	9.3	0.12741	6.8	0.68	2020	111	2041	85	2063	120	98
b55	2406	63	4	0.39	4370	0.05787	2.2	0.4285	4.1	0.05370	3.5	0.54	363	8	362	13	359	78	101
b56	*3380*	*76*	*4*	*0.51*	*1522*	*0.05542*	*2.2*	*0.5209*	*4.9*	*0.06817*	*4.4*	*0.44*	*348*	*7*	*426*	*17*	*874*	*91*	*40*
b57	*2978*	*72*	*4*	*0.56*	*5726*	*0.05668*	*2.9*	*0.4094*	*5.3*	*0.05239*	*4.5*	*0.54*	*355*	*10*	*348*	*16*	*302*	*102*	*118*
b58	615	12	1	0.38	1144	0.05875	3.2	0.4359	6.5	0.05382	5.7	0.49	368	11	367	20	364	129	101
b59	3217	75	4	0.15	6090	0.05505	2.6	0.4047	4.7	0.05331	4.0	0.55	345	9	345	14	342	90	101
b60	*2672*	*60*	*3*	*0.39*	*4972*	*0.05178*	*2.4*	*0.3855*	*4.3*	*0.05399*	*3.5*	*0.57*	*325*	*8*	*331*	*12*	*371*	*79*	*88*

Table 1 — Sk 5 (Sandstone b, Postelwitz Formation, Middle Turonian) — 50° 53′ 47.4″ N; 14° 14′ 15.5″ E, measured single zircon grains: 116, concordant within 90 – 110% of concordance: 69

					Isotope ratios[c]							Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U^b	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				%		%		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	%
a2	*4280*	*76*	*3*	*1.03*	*670*	*0.03944*	*2.3*	*0.3216*	*4.6*	*0.05915*	*4.0*	*0.51*	*249*	*6*	*283*	*12*	*573*	*87*	*44*

Table 1 — Sk 5 (Sandstone b, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a3	*40709*	*340*	*29*	*0.38*	*2987*	*0.08238*	*2.3*	*0.7120*	*2.6*	*0.06269*	*1.4*	*0.85*	*510*	*11*	*546*	*11*	*698*	*30*	*73*
a4	*22119*	*313*	*20*	*0.91*	*38951*	*0.05486*	*2.5*	*0.4298*	*3.1*	*0.05682*	*1.8*	*0.82*	*344*	*9*	*363*	*10*	*485*	*39*	*71*
a5	30418	399	24	0.12	5033	0.06515	2.2	0.5022	2.5	0.05591	1.2	0.88	407	9	413	9	449	27	91
a6	19768	289	15	0.15	2801	0.05422	2.3	0.3994	2.7	0.05342	1.5	0.83	340	8	341	8	347	34	98
a8	11853	182	10	0.34	2737	0.05420	2.7	0.3998	3.8	0.05350	2.6	0.71	340	9	342	11	350	60	97
a9	10817	111	9	0.65	3488	0.07642	2.3	0.6034	3.2	0.05727	2.2	0.72	475	11	479	12	502	49	95
a10	*12381*	*138*	*8*	*0.24*	*425*	*0.05347*	*2.6*	*0.5659*	*6.9*	*0.07676*	*6.4*	*0.38*	*336*	*9*	*455*	*26*	*1115*	*127*	*30*
a11	*2699*	*47*	*3*	*1.65*	*2796*	*0.04935*	*2.5*	*0.3771*	*3.9*	*0.05543*	*3.0*	*0.64*	*311*	*7*	*325*	*11*	*429*	*66*	*72*
a13	*9086*	*140*	*8*	*0.60*	*839*	*0.05360*	*2.4*	*0.4918*	*6.7*	*0.06654*	*6.3*	*0.36*	*337*	*8*	*406*	*23*	*823*	*131*	*41*
a14	*19926*	*298*	*17*	*0.28*	*1402*	*0.05636*	*3.0*	*0.4922*	*6.7*	*0.06334*	*6.0*	*0.44*	*353*	*10*	*406*	*23*	*720*	*128*	*49*
a15	*2545*	*42*	*3*	*1.28*	*484*	*0.05724*	*3.0*	*0.5128*	*4.7*	*0.06497*	*3.6*	*0.64*	*359*	*11*	*420*	*16*	*773*	*76*	*46*
a16	5460	107	6	0.64	1706	0.05293	2.5	0.3842	3.4	0.05265	2.3	0.74	333	8	330	10	314	52	106
a17	9294	184	10	0.34	4554	0.05536	2.3	0.4087	3.0	0.05354	1.9	0.77	347	8	348	9	352	43	99
b2	4718	51	5	1.44	1298	0.08444	2.8	0.6810	4.3	0.05849	3.3	0.66	523	14	527	18	548	71	95
b3	25554	455	24	0.16	25832	0.05500	2.5	0.4045	2.9	0.05335	1.4	0.88	345	9	345	8	344	31	100
b5	4105	32	4	0.61	6584	0.10887	2.9	0.9342	4.8	0.06223	3.7	0.62	666	19	670	24	682	80	98
b8	24147	213	24	0.82	39893	0.09986	2.8	0.8315	3.2	0.06040	1.6	0.86	614	16	614	15	618	35	99
b9	41775	68	24	0.95	6981	0.29662	2.7	4.3753	3.1	0.10698	1.6	0.86	1675	40	1708	26	1749	29	96
b10	*10548*	*184*	*9*	*0.40*	*468*	*0.04617*	*3.1*	*0.4491*	*4.6*	*0.07056*	*3.4*	*0.68*	*291*	*9*	*377*	*15*	*945*	*70*	*31*
b11	20705	273	16	0.32	1429	0.05858	2.7	0.4342	5.3	0.05376	4.6	0.51	367	10	366	16	361	103	102
b15	*17081*	*209*	*13*	*0.46*	*503*	*0.05635*	*2.8*	*0.6125*	*5.8*	*0.07883*	*5.0*	*0.49*	*353*	*10*	*485*	*23*	*1168*	*100*	*30*
b16	96413	127	45	0.76	281	0.28513	3.1	3.8403	3.6	0.09768	1.8	0.87	1617	45	1601	29	1580	34	102
b18	4969	47	5	0.50	8202	0.09978	2.7	0.8324	4.3	0.06050	3.4	0.62	613	16	615	20	622	73	99
b19	5091	56	5	0.74	1210	0.08389	2.7	0.6852	3.7	0.05924	2.6	0.72	519	13	530	16	576	56	90
b20	10369	204	11	0.35	5866	0.05388	2.7	0.3979	3.5	0.05356	2.2	0.77	338	9	340	10	353	50	96
b21	173318	3665	202	0.09	3989	0.04991	2.6	0.3636	3.0	0.05284	1.4	0.88	314	8	315	8	322	33	98
b24	14557	179	16	0.64	3318	0.08321	3.0	0.6631	3.5	0.05779	1.8	0.86	515	15	516	14	522	39	99
b25	27888	314	25	0.30	1160	0.07799	2.8	0.6156	4.7	0.05724	3.8	0.59	484	13	487	18	501	83	97
b26	224306	273	109	0.69	7447	0.35334	2.6	6.0646	2.8	0.12448	1.1	0.92	1951	44	1985	25	2021	19	96
b27	4581	99	6	0.91	1693	0.05563	2.7	0.4146	4.0	0.05405	2.9	0.68	349	9	352	12	373	66	93
b28	59366	419	51	0.97	567	0.10082	3.5	0.8587	3.8	0.06178	1.7	0.90	619	20	629	18	666	36	93
b29	9323	173	11	0.20	3735	0.06336	2.7	0.4777	3.8	0.05468	2.7	0.71	396	10	397	13	399	61	99
b30	7877	100	8	0.24	13531	0.08290	2.9	0.6617	3.7	0.05788	2.3	0.79	513	14	516	15	525	50	98
b32	18203	48	14	0.74	7694	0.26084	2.7	3.3060	3.1	0.09193	1.6	0.86	1494	36	1482	25	1466	31	102
b33	5023	111	8	2.06	3667	0.05377	2.7	0.3968	3.9	0.05353	2.8	0.69	338	9	339	11	351	64	96
b35	3165	69	4	0.91	5823	0.05956	2.8	0.4462	4.2	0.05433	3.2	0.66	373	10	375	13	385	72	97

Table 1 — Sk 5 (Sandstone b, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b36	84598	195	72	1.29	30618	0.29616	2.7	4.0859	2.9	0.10006	1.1	0.92	1672	39	1651	24	1625	21	103
b38	*20754*	*375*	*21*	*0.77*	*1498*	*0.05144*	*2.6*	*0.4308*	*4.8*	*0.06073*	*4.0*	*0.54*	*323*	*8*	*364*	*15*	*630*	*86*	*51*
b39	8529	102	11	0.37	4023	0.10695	3.4	0.8995	6.2	0.06100	5.1	0.55	655	21	651	30	639	111	102
b40	80207	92	39	0.47	10793	0.39144	2.6	6.9194	2.8	0.12820	1.1	0.92	2130	47	2101	25	2073	19	103
b41	8050	140	8	0.61	8426	0.05382	2.6	0.3954	3.6	0.05329	2.5	0.72	338	9	338	11	341	57	99
b42	17286	189	17	0.37	28417	0.08874	2.9	0.7137	3.6	0.05833	2.2	0.80	548	15	547	15	542	47	101
b43	7530	78	7	0.74	3632	0.07712	2.7	0.6087	3.6	0.05724	2.4	0.75	479	12	483	14	501	52	96
b44	2960	42	2	0.42	1631	0.05576	2.9	0.4104	4.7	0.05338	3.7	0.61	350	10	349	14	345	84	101
b46	11589	78	9	0.74	18996	0.10695	2.7	0.8987	4.0	0.06094	3.1	0.66	655	17	651	20	637	66	103
b47	11766	156	8	0.11	17144	0.05578	2.7	0.4082	3.2	0.05307	1.6	0.87	350	9	348	9	332	35	105
b48	11391	144	7	0.03	9509	0.05586	2.6	0.4142	3.3	0.05379	2.0	0.79	350	9	352	10	362	46	97
b49	4068	50	3	1.40	3807	0.05693	2.6	0.4233	4.4	0.05393	3.6	0.59	357	9	358	13	368	80	97
b50	5166	26	3	0.60	6230	0.10865	2.6	0.9279	3.8	0.06194	2.8	0.69	665	17	667	19	672	59	99
b52	34312	101	26	0.76	357	0.25475	6.9	3.2535	8.5	0.09263	5.1	0.80	1463	90	1470	69	1480	96	99
b53	5905	50	3	0.21	8297	0.06804	2.8	0.5252	3.9	0.05598	2.7	0.72	424	12	429	14	452	60	94
b54	14860	165	8	0.18	8458	0.05033	2.5	0.3659	3.2	0.05273	2.0	0.79	317	8	317	9	317	45	100
b55	4659	46	3	1.11	5443	0.05469	2.7	0.4075	4.2	0.05404	3.2	0.65	343	9	347	12	373	71	92
b57	19697	145	10	0.25	28729	0.06770	3.0	0.5209	3.4	0.05581	1.6	0.88	422	12	426	12	445	36	95
b58	5008	48	3	0.27	9235	0.05568	2.8	0.4159	3.7	0.05417	2.5	0.74	349	9	353	11	378	56	92
b59	17793	134	8	0.16	517	0.06065	3.3	0.4510	6.0	0.05393	4.9	0.56	380	12	378	19	368	111	103
b60	63553	291	18	0.07	430	0.06288	2.9	0.4785	4.1	0.05520	2.8	0.72	393	11	397	13	420	62	94
b62	28657	122	11	0.10	10000	0.09511	2.6	0.7749	2.9	0.05909	1.2	0.91	586	15	583	13	570	27	103
b63	8204	35	3	0.54	5050	0.09407	2.7	0.7696	3.8	0.05934	2.8	0.69	580	15	580	17	580	60	100
b64	*4949*	*52*	*2*	*1.05*	*1804*	*0.03787*	*2.5*	*0.2764*	*4.0*	*0.05293*	*3.1*	*0.63*	*240*	*6*	*248*	*9*	*326*	*70*	*74*
b65	8495	16	3	0.79	4469	0.16686	3.0	1.6789	4.1	0.07297	2.8	0.73	995	27	1001	26	1013	56	98
b66	27081	109	12	0.99	4893	0.09585	2.6	0.8108	2.9	0.06135	1.2	0.91	590	15	603	13	652	25	91
c2	9490	128	11	0.53	16606	0.07996	2.0	0.6382	2.6	0.05789	1.6	0.78	496	10	501	10	526	35	94
c3	*44795*	*971*	*51*	*0.29*	*9300*	*0.05362*	*1.4*	*0.4022*	*1.9*	*0.05441*	*1.2*	*0.76*	*337*	*5*	*343*	*5*	*388*	*27*	*87*
c4	*8295*	*187*	*10*	*0.59*	*3017*	*0.05071*	*1.9*	*0.3887*	*3.2*	*0.05559*	*2.6*	*0.58*	*319*	*6*	*333*	*9*	*436*	*58*	*73*
c5	*28825*	*655*	*34*	*0.23*	*18162*	*0.05308*	*1.5*	*0.4030*	*2.0*	*0.05505*	*1.3*	*0.75*	*333*	*5*	*344*	*6*	*414*	*29*	*80*
c6	*7518*	*158*	*8*	*0.36*	*1258*	*0.05082*	*2.0*	*0.4206*	*3.3*	*0.06003*	*2.6*	*0.60*	*320*	*6*	*356*	*10*	*605*	*57*	*53*
c7	6919	74	8	0.53	11330	0.10543	2.2	0.8995	3.7	0.06187	2.9	0.61	646	14	651	18	670	62	96
c8	*4604*	*90*	*5*	*0.39*	*7913*	*0.06046*	*2.2*	*0.4910*	*4.8*	*0.05890*	*4.2*	*0.46*	*378*	*8*	*406*	*16*	*563*	*92*	*67*
c9	52460	95	42	1.52	11199	0.33394	1.8	5.4271	2.4	0.11787	1.6	0.75	1857	30	1889	21	1924	29	97
c11	*23525*	*246*	*19*	*0.19*	*521*	*0.07254*	*2.4*	*0.8409*	*4.9*	*0.08407*	*4.3*	*0.48*	*451*	*10*	*620*	*23*	*1294*	*84*	*35*
d2	106465	103	51	1.01	82459	0.41460	3.6	7.4195	3.7	0.12979	0.9	0.97	2236	68	2163	33	2095	15	107

Table 1 — Sk 5 (Sandstone b, Postelwitz Formation, Middle Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
d3	31680	118	62	1.00	6114	0.01940	3.9	0.1434	10.8	0.05360	10.1	0.36	124	5	136	14	354	227	35
d4	9272	73	8	0.44	2361	0.10581	3.9	0.8907	5.0	0.06105	3.1	0.79	648	24	647	24	641	66	101
d6	39459	332	37	0.81	4450	0.09986	3.5	0.8608	4.1	0.06252	2.2	0.84	614	20	631	20	692	47	89
d7	41243	268	29	0.26	886	0.10312	3.5	1.1788	3.9	0.08290	1.7	0.90	633	21	791	22	1267	33	50
d8	12149	227	14	0.63	3573	0.05890	3.7	0.4369	4.3	0.05380	2.3	0.85	369	13	368	13	363	51	102
d9	15496	152	16	1.05	2989	0.08484	3.7	0.7396	4.3	0.06323	2.1	0.87	525	19	562	19	716	45	73
d11	19304	368	22	0.44	4279	0.05973	3.6	0.4457	4.2	0.05412	2.2	0.85	374	13	374	13	376	50	99
d13	22761	370	22	0.16	2348	0.06061	4.0	0.5156	4.8	0.06169	2.7	0.83	379	15	422	17	663	58	57
d14	107165	208	74	0.89	7768	0.30778	3.6	4.3646	3.7	0.10285	1.1	0.96	1730	55	1706	31	1676	20	103
d15	12338	205	13	0.69	940	0.05719	3.7	0.5402	4.9	0.06851	3.2	0.75	359	13	439	18	884	67	41
d16	14695	312	17	0.18	4775	0.05652	3.6	0.4244	4.1	0.05446	2.0	0.87	354	12	359	12	390	45	91
d17	5791	107	7	1.18	1221	0.05709	3.5	0.4774	4.4	0.06064	2.6	0.81	358	12	396	14	627	56	57
d18	6841	95	8	0.47	11851	0.08514	3.6	0.6779	4.6	0.05775	2.9	0.78	527	18	526	19	520	63	101
d20	16980	333	17	0.38	1221	0.05053	4.2	0.3601	8.8	0.05168	7.8	0.47	318	13	312	24	271	178	117
d21	15521	180	19	0.69	8071	0.09431	3.7	0.7888	4.2	0.06066	1.9	0.89	581	21	590	19	627	42	93
d24	15655	248	20	0.95	2303	0.06796	3.7	0.5635	4.7	0.06013	2.8	0.80	424	15	454	17	608	61	70
d25	2652	60	3	0.20	1211	0.05965	3.7	0.4421	5.1	0.05376	3.5	0.73	373	13	372	16	361	78	103
d27	8363	211	11	0.30	15685	0.05501	3.6	0.4059	4.1	0.05351	2.0	0.88	345	12	346	12	350	44	99
d28	2381	27	3	0.45	3844	0.11525	4.0	0.9797	5.0	0.06165	3.0	0.80	703	27	693	25	662	63	106
d29	37749	395	28	1.24	109	0.05002	4.4	1.3122	6.4	0.19025	4.7	0.69	315	14	851	38	2744	77	11
d31	12228	157	19	1.96	3103	0.08579	3.7	0.7345	4.3	0.06209	2.1	0.87	531	19	559	19	677	45	78
d32	7338	209	12	0.54	5968	0.05473	3.6	0.4170	4.7	0.05526	3.0	0.78	343	12	354	14	423	66	81
d33	4976	142	9	0.98	5581	0.05315	3.6	0.3924	4.3	0.05355	2.4	0.83	334	12	336	12	352	53	95
d35	7516	188	10	0.37	1692	0.05182	4.0	0.4280	4.9	0.05990	2.8	0.83	326	13	362	15	600	60	54
d37	6405	168	12	1.38	2644	0.05645	3.5	0.4375	4.8	0.05621	3.3	0.73	354	12	369	15	461	73	77
d38	1869	14	2	0.87	358	0.12734	3.8	1.5096	8.5	0.08598	7.6	0.45	773	28	934	53	1338	146	58
d39	2779	64	4	0.17	5142	0.05792	3.8	0.4331	5.3	0.05423	3.8	0.70	363	13	365	17	381	85	95
d40	12770	129	16	0.60	4810	0.11888	3.5	1.0610	4.4	0.06473	2.6	0.81	724	24	734	23	766	54	95
d41	6278	135	8	0.35	8173	0.05859	3.5	0.4467	4.6	0.05530	2.9	0.78	367	13	375	14	424	64	87
d43	6174	108	7	0.44	11428	0.06009	3.6	0.4528	4.8	0.05465	3.2	0.75	376	13	379	15	398	71	95
d44	11669	209	12	0.18	4589	0.05880	3.6	0.4703	4.4	0.05800	2.6	0.81	368	13	391	14	530	56	70

Table 1 — Sk 6-2 (*labiatus* Sandstone, Schmilka Formation, Lower Turonian) — 50° 52′28.8″ N; 14° 14′02.2″ E, measured single zircon grains: 126, concordant within 90–110% of concordance: 41

					Isotope ratios[c]								Ages						
Number	$^{207}Pb^{a}$ [cps]	U^{b} [ppm]	Pb^{b} [ppm]	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ [%]	$^{207}Pb/^{235}U^{c}$	2 σ [%]	$^{207}Pb/^{206}Pb^{e}$	2 σ [%]	Rho^{d}	$^{206}Pb/^{238}U$ [Ma]	2 σ [Ma]	$^{207}Pb/^{235}U$ [Ma]	2 σ [Ma]	$^{207}Pb/^{206}Pb$ [Ma]	2 σ [Ma]	conc [%]
a1	11174	232	19	0.53	3589	0.07569	2.6	0.6390	3.4	0.06123	2.2	0.76	470	12	502	14	647	48	73
a2	7767	250	11	0.27	937	0.04134	3.6	0.4176	5.3	0.07326	4.0	0.67	261	9	354	16	1021	80	26
a3	1602	57	3	0.08	2143	0.05700	3.3	0.4306	6.2	0.05479	5.2	0.53	357	11	364	19	403	116	89
a4	34828	593	32	0.31	147	0.04119	2.4	0.9600	5.4	0.16902	4.8	0.44	260	6	683	27	2548	81	10
a5	696	25	1	0.96	1214	0.05298	4.5	0.4226	6.7	0.05785	5.0	0.67	333	14	358	20	524	109	64
a6	8569	245	17	0.17	4394	0.07378	2.4	0.6084	3.6	0.05981	2.6	0.68	459	11	483	14	597	57	77
a7	1458	29	4	2.20	1174	0.09721	3.0	0.8084	6.8	0.06032	6.1	0.45	598	17	602	31	615	131	97
a8	15233	251	33	0.50	6058	0.12720	5.6	1.1433	7.3	0.06519	4.8	0.76	772	41	774	40	780	100	99
a9	3051	57	7	0.50	924	0.11681	3.0	1.1955	8.5	0.07423	7.9	0.36	712	20	799	48	1048	159	68
a10	416	16	1	0.47	751	0.06167	4.4	0.4668	9.3	0.05489	8.1	0.48	386	17	389	30	408	182	95
a11	4872	143	10	0.19	7783	0.07244	2.2	0.5832	3.6	0.05839	2.8	0.62	451	10	467	14	545	62	83
a12	1931	39	5	1.10	803	0.11098	3.5	1.0237	6.2	0.06690	5.2	0.55	678	22	716	33	835	108	81
a13	2551	108	5	0.09	4693	0.05445	3.2	0.4126	6.0	0.05497	5.1	0.53	342	11	351	18	411	114	83
a14	1388	56	4	0.52	2587	0.06073	2.8	0.4559	7.7	0.05445	7.1	0.37	380	10	381	25	390	160	98
a15	19372	418	23	0.34	105	0.04257	2.7	1.1151	4.3	0.19000	3.3	0.63	269	7	761	23	2742	54	10
a16	2842	76	6	0.40	4302	0.07487	2.5	0.6076	4.6	0.05886	3.9	0.54	465	11	482	18	562	84	83
a17	1878	54	4	0.31	3262	0.08024	2.8	0.6409	4.8	0.05793	4.0	0.57	498	13	503	19	527	87	94
a18	5702	136	11	0.60	1631	0.07723	3.5	0.6954	6.5	0.06531	5.4	0.54	480	16	536	27	784	114	61
a19	9249	9	6	0.29	4227	0.59549	4.4	17.9278	6.4	0.21835	4.7	0.69	3012	106	2986	63	2969	75	101
a20	3021	144	7	0.64	5550	0.04584	6.2	0.3478	8.8	0.05503	6.3	0.70	289	18	303	23	414	141	70
a21	2782	130	7	0.02	5087	0.05845	2.8	0.4398	5.0	0.05458	4.2	0.55	366	10	370	16	395	93	93
a22	884	75	3	0.69	772	0.03388	7.0	0.2537	13.0	0.05430	10.9	0.54	215	15	230	27	383	245	56
a23	1895	48	5	0.32	3350	0.10643	5.4	0.8356	8.9	0.05694	7.1	0.60	652	33	617	42	489	157	133
a24	3489	182	11	0.34	6465	0.06207	4.2	0.4673	5.7	0.05461	3.9	0.73	388	16	389	19	396	87	98
a25	40330	692	49	0.43	95	0.04879	2.1	1.4349	2.7	0.21329	1.6	0.80	307	6	904	16	2931	26	10
a26	2770	154	9	0.66	5610	0.05368	2.0	0.3686	4.8	0.04980	4.4	0.42	337	7	319	13	186	101	182
a27	668	35	3	1.70	1285	0.05793	2.8	0.4183	7.8	0.05237	7.2	0.37	363	10	355	24	302	165	120
a28	32522	264	63	0.47	8611	0.22861	4.0	2.7740	5.4	0.08801	3.6	0.74	1327	48	1349	41	1383	70	96
a29	2913	167	9	0.28	5479	0.05320	3.4	0.3921	5.3	0.05346	4.1	0.63	334	11	336	15	348	93	96
a30	25377	582	29	0.21	97	0.03457	3.2	0.9088	9.0	0.19068	8.4	0.36	219	7	656	45	2748	139	8
a31	1561	57	5	0.45	2447	0.08597	2.6	0.7422	6.1	0.06261	5.5	0.43	532	13	564	27	695	118	76
a32	7622	33	13	0.63	6681	0.36283	3.5	5.7724	5.0	0.11539	3.6	0.69	1996	60	1942	44	1886	65	106
a33	2760	121	9	0.36	4814	0.07230	2.9	0.5747	4.3	0.05765	3.1	0.69	450	13	461	16	517	68	87
a34	6570	106	19	0.66	9206	0.16875	2.7	1.6722	3.5	0.07187	2.3	0.75	1005	25	998	23	982	47	102
a35	24695	290	88	0.19	2480	0.31134	3.1	3.7422	6.5	0.08717	5.7	0.47	1747	47	1580	53	1364	110	128
a36	5430	196	16	0.17	3784	0.08351	3.8	0.7482	5.0	0.06498	3.3	0.76	517	19	567	22	774	69	67

Table 1 — Sk 6-2 (*labiatus* Sandstone, Schmilka Formation, Lower Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^{a}$	U^{b}	Pb^{b}	Th/U^{b}	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^{c}$	2 σ	$^{207}Pb/^{235}U^{c}$	2 σ	$^{207}Pb/^{206}Pb^{e}$	2 σ	Rho^{d}	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
a37	3838	217	13	0.60	6934	0.05852	3.3	0.4503	5.0	0.05581	3.8	0.66	367	12	378	16	445	83	82
a38	2056	71	5	0.43	3497	0.07543	3.2	0.6162	5.4	0.05924	4.3	0.59	469	14	487	21	576	94	81
a39	10170	337	24	0.21	3767	0.07506	3.1	0.5864	4.0	0.05666	2.6	0.77	467	14	469	15	478	57	98
a40	1714	40	5	0.82	2831	0.10652	4.2	0.9001	10.6	0.06129	9.7	0.40	653	26	652	52	649	209	100
b1	3515	98	9	0.29	1696	0.09382	2.1	0.9355	5.6	0.07232	5.2	0.36	578	11	671	28	995	107	58
b2	4167	92	10	0.80	6771	0.09681	3.8	0.8162	5.1	0.06115	3.4	0.74	596	22	606	23	644	73	92
b3	5972	147	16	0.94	2472	0.09686	3.0	0.8731	4.3	0.06537	3.1	0.69	596	17	637	20	786	65	76
b4	2398	97	6	0.46	1931	0.05912	3.3	0.4479	5.2	0.05494	4.1	0.63	370	12	376	17	410	91	90
b5	1452	57	3	0.33	2596	0.06045	2.6	0.4690	5.3	0.05627	4.7	0.48	378	10	391	17	463	103	82
b6	2263	85	5	0.05	4229	0.06159	2.6	0.4585	4.9	0.05399	4.1	0.54	385	10	383	16	371	93	104
b7	38282	589	36	0.42	104	0.04397	3.0	1.1944	5.2	0.19703	4.2	0.58	277	8	798	29	2802	69	10
b8	4052	251	11	1.04	7907	0.03641	2.8	0.2583	4.2	0.05145	3.1	0.67	231	6	233	9	261	71	88
b9	2688	100	6	0.19	4783	0.06087	2.5	0.4741	5.7	0.05649	5.1	0.44	381	9	394	19	472	113	81
b10	3670	93	8	0.61	6442	0.07976	2.3	0.6308	3.7	0.05736	2.9	0.61	495	11	497	15	506	64	98
b11	4014	172	9	0.39	2690	0.05409	2.8	0.4075	4.5	0.05463	3.5	0.63	340	9	347	13	397	78	85
b12	4655	200	10	0.33	8585	0.05015	2.5	0.3759	4.1	0.05436	3.2	0.61	315	8	324	11	386	73	82
b13	111446	176	66	0.34	8423	0.34175	5.6	9.2301	6.1	0.19588	2.6	0.91	1895	92	2361	58	2792	42	68
b14	5972	141	13	0.15	3792	0.09255	2.3	0.8761	6.8	0.06866	6.4	0.34	571	13	639	33	888	132	64
b15	1687	77	5	0.56	3225	0.06143	3.4	0.4447	7.2	0.05250	6.3	0.48	384	13	374	23	307	143	125
b16	13017	403	27	0.09	467	0.06768	7.0	0.6024	20.1	0.06456	18.9	0.35	422	29	479	80	760	398	56
b17	27915	93	39	0.80	23137	0.37297	3.0	6.1716	3.9	0.12001	2.5	0.77	2043	54	2000	35	1956	44	104
b18	2078	87	5	0.19	3977	0.06265	2.6	0.4541	5.7	0.05258	5.0	0.46	392	10	380	18	311	114	126
b19	4376	184	10	0.51	5945	0.05531	2.8	0.4308	5.2	0.05648	4.3	0.55	347	10	364	16	471	96	74
b20	4506	157	10	0.10	8159	0.06582	2.9	0.5038	4.0	0.05551	2.8	0.72	411	12	414	14	433	62	95
b21	2350	108	6	0.38	1250	0.05773	1.9	0.4263	5.8	0.05355	5.5	0.33	362	7	361	18	352	123	103
b22	5610	48	11	0.53	1456	0.21815	3.2	2.3567	3.9	0.07835	2.3	0.81	1272	37	1230	28	1156	46	110
b23	6473	173	12	0.11	3642	0.06768	2.1	0.6494	7.7	0.06959	7.4	0.28	422	9	508	31	916	153	46
b24	6308	295	19	0.40	11103	0.06307	4.6	0.4896	7.0	0.05630	5.3	0.66	394	18	405	24	464	117	85
b25	2651	112	7	0.03	1151	0.06541	3.3	0.4956	5.6	0.05495	4.6	0.58	408	13	409	19	410	102	100
b26	2299	109	6	0.72	3909	0.05541	2.3	0.4514	5.5	0.05908	4.9	0.43	348	8	378	17	570	108	61
b27	5234	113	14	0.60	8340	0.11362	2.9	0.9923	4.8	0.06334	3.9	0.60	694	19	700	25	720	82	96
b28	2950	239	9	0.43	1921	0.03494	2.7	0.2969	4.3	0.06164	3.4	0.62	221	6	264	10	661	73	33
b29	23988	80	33	0.71	8861	0.37108	7.4	6.4285	8.7	0.12564	4.5	0.86	2034	131	2036	79	2038	79	100
b30	6558	300	19	0.77	11993	0.05566	3.0	0.4227	4.2	0.05507	2.9	0.71	349	10	358	13	415	66	84
b32	2118	106	6	0.71	3965	0.05578	2.6	0.4138	5.5	0.05380	4.8	0.48	350	9	352	16	363	109	96
b34	7286	232	14	0.17	552	0.05628	3.8	0.6775	5.2	0.08731	3.5	0.73	353	13	525	21	1367	68	26

Table 1 — Sk 6-2 (*labiatus* Sandstone, Schmilka Formation, Lower Turonian) continued.

					Isotope ratios[c]								Ages						
	$^{207}Pb^a$	U^b	Pb^b	Th/U^b	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U^c$	2 σ	$^{207}Pb/^{235}U^c$	2 σ	$^{207}Pb/^{206}Pb^e$	2 σ	Rho^d	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
b35	6791	371	21	0.36	3090	0.05891	5.0	0.4461	6.9	0.05493	4.7	0.73	369	18	375	22	409	106	90
b36	11602	387	18	0.38	268	0.03998	3.2	0.6068	6.8	0.11008	5.9	0.48	253	8	482	26	1801	108	14
b37	4956	244	13	0.22	2194	0.05507	2.0	0.4618	3.7	0.06081	3.2	0.54	346	7	385	12	633	68	55
b38	12133	102	25	0.72	13427	0.22592	2.2	2.8129	4.2	0.09031	3.6	0.53	1313	26	1359	32	1432	68	92
b39	2702	76	6	0.24	2192	0.08163	2.8	0.6282	5.0	0.05581	4.2	0.56	506	14	495	20	445	93	114
b40	13629	67	18	0.39	13979	0.26094	4.0	3.5245	4.4	0.09796	1.8	0.92	1495	54	1533	35	1586	33	94
b42	3987	107	7	0.21	2010	0.06806	3.1	0.5504	5.2	0.05865	4.2	0.60	424	13	445	19	554	92	77
b43	10762	230	12	0.29	182	0.04482	1.4	0.7859	5.7	0.12716	5.5	0.24	283	4	589	26	2059	97	14
b44	5953	130	11	0.48	1779	0.08318	2.1	0.7461	3.2	0.06505	2.4	0.67	515	11	566	14	776	50	66
b45	2877	63	7	0.70	2603	0.09917	1.8	0.7976	4.8	0.05833	4.5	0.37	610	10	595	22	542	98	112
b46	1291	42	3	0.56	2214	0.06416	2.6	0.5226	6.2	0.05907	5.6	0.42	401	10	427	22	570	122	70
b47	16915	208	13	0.43	121	0.04303	7.3	1.0806	9.8	0.18214	6.5	0.74	272	19	744	53	2672	108	10
b48	3599	106	5	0.12	3379	0.05333	2.7	0.3890	4.2	0.05289	3.2	0.65	335	9	334	12	324	73	103
b49	1425	53	2	0.31	874	0.02802	4.2	0.6449	10.4	0.16694	9.5	0.41	178	7	505	42	2527	159	7
b50	1152	36	2	0.97	458	0.04943	3.3	0.5897	11.9	0.08653	11.5	0.28	311	10	471	46	1350	221	23
b52	3627	62	6	0.53	4163	0.08640	3.6	0.7166	4.9	0.06016	3.3	0.75	534	19	549	21	609	70	88
b53	4137	106	6	0.26	7597	0.05795	1.6	0.4376	4.6	0.05476	4.3	0.35	363	6	369	14	403	95	90
b54	3431	83	5	0.14	6081	0.05877	3.2	0.4581	5.0	0.05653	3.8	0.64	368	11	383	16	473	84	78
b55	5273	119	6	0.02	1683	0.05336	3.5	0.4373	5.2	0.05944	3.9	0.66	335	11	368	16	583	85	57
b56	5848	73	4	0.51	269	0.05136	4.6	0.7374	9.5	0.10413	8.3	0.49	323	14	561	42	1699	152	19
b57	4187	98	5	0.20	3107	0.05801	3.6	0.4598	6.5	0.05748	5.5	0.54	364	13	384	21	510	120	71
b58	3070	33	4	1.05	4365	0.11020	2.3	0.9415	4.6	0.06196	3.9	0.51	674	15	674	23	673	84	100
b59	13243	146	5	0.30	97	0.02395	4.5	0.6510	11.0	0.19718	10.1	0.41	153	7	509	45	2803	165	5
b60	1610	15	2	1.00	1390	0.12363	2.3	1.0972	5.5	0.06436	5.0	0.41	751	16	752	30	754	106	100
c1	2618	48	6	0.36	3247	0.13017	3.8	1.2075	5.7	0.06728	4.3	0.66	789	28	804	32	846	89	93
c2	2596	78	7	0.19	689	0.09754	2.6	0.8850	9.0	0.06581	8.6	0.29	600	15	644	44	800	180	75
c3	5261	246	7	0.62	200	0.02183	13.2	0.4536	16.6	0.15068	10.1	0.80	139	18	380	54	2354	172	6
c4	1598	67	5	0.50	2832	0.07195	2.4	0.5709	5.5	0.05755	5.0	0.43	448	10	459	21	513	109	87
c5	1443	71	4	0.31	1584	0.05791	3.5	0.4383	6.6	0.05489	5.6	0.53	363	12	369	21	408	124	89
c6	2506	112	7	0.36	4680	0.06304	3.0	0.4717	4.9	0.05427	3.8	0.62	394	12	392	16	382	86	103
c7	6019	170	13	0.33	1032	0.07518	4.9	0.7547	6.5	0.07281	4.3	0.75	467	22	571	29	1009	87	46
c8	2702	167	9	0.14	4893	0.05890	1.9	0.4443	6.7	0.05471	6.4	0.28	369	7	373	21	400	144	92
c9	2237	54	6	0.48	3777	0.10409	3.9	0.8652	5.4	0.06028	3.7	0.72	638	24	633	26	614	80	104
c10	97462	1218	77	0.12	48	0.03045	5.8	1.8122	6.5	0.43167	2.8	0.90	193	11	1050	43	4023	42	5
c11	6260	129	14	0.27	2556	0.10536	4.2	1.0668	7.2	0.07343	5.8	0.59	646	26	737	38	1026	118	63
c12	1675	37	4	0.81	2073	0.08694	4.3	0.7761	7.6	0.06475	6.2	0.57	537	22	583	34	766	131	70

Table 1 — Sk 6-2 (*labiatus* Sandstone, Schmilka Formation, Lower Turonian) continued.

					Isotope ratios[c]								Ages						
	^{207}Pb[a]	U[b]	Pb[b]	Th/U[b]	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{238}U$[c]	2 σ	$^{207}Pb/^{235}U$[c]	2 σ	$^{207}Pb/^{206}Pb$[e]	2 σ	Rho[d]	$^{206}Pb/^{238}U$	2 σ	$^{207}Pb/^{235}U$	2 σ	$^{207}Pb/^{206}Pb$	2 σ	conc
Number	[cps]	[ppm]	[ppm]				[%]		[%]		[%]		[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[Ma]	[%]
c13	3870	189	11	0.03	7083	0.06504	3.1	0.5008	5.9	0.05584	5.0	0.53	406	12	412	20	446	112	91
c14	4384	226	13	0.32	8049	0.05806	5.4	0.4433	7.4	0.05538	5.1	0.72	364	19	373	24	428	114	85
c15	4708	83	10	0.98	520	0.09223	3.3	1.1860	5.1	0.09326	3.9	0.64	569	18	794	29	1493	74	38
c16	2384	77	6	0.29	4161	0.08355	2.3	0.6694	4.1	0.05811	3.4	0.55	517	11	520	17	534	75	97
c17	2965	159	9	0.40	5307	0.05721	2.4	0.4516	5.2	0.05726	4.6	0.46	359	8	378	16	501	100	72
c18	3150	171	9	0.14	5906	0.05684	3.6	0.4267	5.9	0.05444	4.7	0.61	356	12	361	18	389	106	92
c19	4510	150	8	0.12	260	0.04974	3.2	0.6482	16.0	0.09450	15.7	0.20	313	10	507	66	1518	295	21
c20	5214	201	14	0.10	8728	0.07175	3.2	0.5917	4.7	0.05981	3.5	0.68	447	14	472	18	597	75	75
c21	1355	70	4	0.32	1403	0.05331	3.5	0.3916	6.9	0.05328	5.9	0.51	335	12	336	20	341	134	98
c22	1128	28	4	1.16	801	0.11693	3.5	1.0914	6.7	0.06769	5.8	0.52	713	23	749	36	859	119	83
c23	3676	137	14	0.39	5681	0.10470	2.2	0.9554	5.0	0.06618	4.5	0.44	642	13	681	25	812	95	79
c24	818	36	2	0.88	1480	0.05915	3.7	0.4583	7.6	0.05619	6.6	0.48	370	13	383	24	460	147	81
c25	8205	222	31	0.52	5607	0.14006	1.8	1.2047	3.9	0.06238	3.5	0.46	845	14	803	22	687	75	123
c26	13786	520	24	0.72	263	0.03599	4.7	0.5925	5.7	0.11939	3.3	0.82	228	11	472	22	1947	59	12
c27	9944	364	19	0.73	233	0.04416	3.0	0.7380	5.1	0.12122	4.1	0.60	279	8	561	22	1974	72	14
c28	3265	173	9	0.42	5958	0.04959	3.9	0.3733	6.1	0.05460	4.7	0.64	312	12	322	17	396	106	79
c29	34208	728	33	0.37	88	0.02931	2.4	0.8644	6.2	0.21387	5.7	0.39	186	4	633	29	2935	92	6
c30	1016	56	3	0.66	1538	0.05259	3.1	0.3857	6.9	0.05319	6.1	0.46	330	10	331	20	337	139	98

[a] Within-run background-corrected mean ^{207}Pb signal in counts per second

[b] U and Pb content and Th/U ratio were calculated relative to GJ-1 and are accurate to approximately 10%

[c] Corrected for background, mass bias, laser induced U-Pb fractionation and common Pb (if detectable, see analytical method) using Stacey & Kramers (1975) model Pb composition. $^{207}Pb/^{235}U$ calculated using $^{207}Pb/^{206}Pb/(^{238}U/^{206}Pb \times 1/137.88)$. Errors are propagated by quadratic addition of within-run errors (2SE) and the reproducibility of GJ-1 (2SD)

[d] Rho is the error correlation defined as $err^{206}Pb/^{238}U/err^{207}Pb/^{235}U$.

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