euhedral crystals in the mylonites developed under greenschist facies conditions.

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Laser-probe 40Ar/39Ar Study of Pseudotachylite and its Host Rock from the Tatra Mountains (Western Carpathians, Slovakia)

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Understanding of the tectonic evolution of orogenic belts and intracratonic areas depends on our ability to determine the age of tectonic features, e.g. ductile shear zones and brittle faults on a variety of crustal scales. Pseudotachylite is dark aphanitic fault-related rock composed of friction-derived melt material interspersed with clasts and crystals from the host-rock, and is thought to be formed in response to seismic activity either meteorite impacts, rapid tectonic faulting or landslides (e.g., Philpotts, 1964; Sibson, 1975; Magloughlin and Spray, 1992; Reimold, 1995). High potassium content of the melt material, derived from the host-rock micas and/or amphiboles makes pseudotachylite an ideal candidate for $^{40}Ar/^{39}Ar$ dating (e.g., Reimold et al., 1990; Sherlock and Hetzel, 2001). Although pseudotachylites were recently described from the Tatra Mts. (Petrík and Reichwalder, 1996; Petrík and Janák, 2001) their age was unknown until now.

The Tatra Mountains are located in northern Slovakia, near the border with Poland, and represent so-called core mountains within the Tatric superunit of the Western Carpathians. The crystalline basement of the Tatra Mts. is composed of pre-Mesozoic metamorphic and granitic rocks, overlain by Mesozoic and Cenozoic sedimentary cover sequences and nappes. Pseudotachylites occur in several places in the Tatra Mts. (e.g., Bystrá Valley in Western Tatra Mts., Velická Valley and Batizovské Lake just on the foothill of Mount Gerlach in the High Tatra Mts.). On the southern slope of Gerlach pseudotachylites are related to several NNE striking faults with a steep dip of 75–90° to ESE and WNW. Pseudotachylite is composed of matrix (crystallised melt) consisting of hematite, albite and K-feldspar, and clasts dominated by feldspars and quartz. It is, inferred that primary melt originated by preferential dehydration melting of biotite (Petrík and Janák, 2001). Several pseudotachylite samples were collected and five were selected for laser-probe $^{40}Ar/^{39}Ar$ study together with two samples of host-rock granitic rocks. The samples were analysed at The Open University Milton Keynes (UK) using a focused CW Nd-Yag infrared laser combined with noble gas mass spectrometer MAP 215–50, according analytical procedure by Sherlock and Hetzel (2001).

The biotite tonalite host-rock yielded a narrow range of ages (322 ± 2 to 331 ± 2 Ma), which were derived from laser spot analyses of biotite only. Weighted mean of spot analyses give an age 328 ±4 Ma, which is in good agreement with previous $^{40}Ar/^{39}Ar$ ages from granitic rocks in the high Tatra Mts. (Maluski et al., 1993), and/or CLC single grain zircon U-Pb data 311 ±16 Ma respectively 314 ± 4 Ma (Poller and Todt, 2001) from the High Tatra Mts. Since the emplacement ages are comparable with the argon cooling ages, it should be noted that the granitic rocks have not experienced any significant argon-loss subsequent to their formation. Ages for the pseudotachylite samples range from 24 to 164 Ma, although ages greater than 65 Ma are related to heterogeneous ^{37}Ar distribution, very variable atmospheric argon component and/or very low potassium (^{39}Ar) content. If these ages are excluded then individual samples yield the following age ranges: TL-9 from 28 to 63 Ma, TT-5b/97 from 28 to 65 Ma, TT-5a/97 from 36 to 65 Ma and TT-6a/97 from 24 to 42 Ma. Since the host-rock did not experience post-crystallization argon loss due to regional reheating (including Neo-Alpine period) we suppose that similarly, the pseudotachylites did not suffer argon loss. The age of pseudotachylite formation is most likely connected with Late Paleogene – Oligocene (36–24 Ma) seismic events.

Hence the age of the Tatra Mts. pseudotachylite formation was unknown, there were only "scientific guess" for its time of origin. Commonly its generation is connected with Tatra Mts. uplift and/or propagation of Sub-Tatra fault e.g. Janák et al. (2001). Authors suggested Miocene age of its origin on the base of existing apatite fission-track data from the Tatra Mts granitic rocks yielding age between 20–10 Ma (Burchart, 1972; Kráľ, 1977). Accordingly, the studied pseudotachylites were probably generated by seismic slip along subsidiary tear faults that accompanied foundation and early stages of development of this large-scale Sub-Tatra detachment fault in the proximity of the ductile/brittle transition. Propagation of the Sub-Tatra fault is connected with origin and subsidence of Central-Carpathian Paleogene Basin in area eastern from the Tatra Mts. We suppose that our dating of the Tatra Mts. pseudotachylite veins enabled identified early stages of the Tatra Mts uplift and/or formation Sub-Tatra fault.

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Neoproterozoic High-Grade Transpression in the Kaoko Belt (NW Namibia)

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The Kaoko orogenic belt represents a NNW-SSE trending branch of the Damara orogenic belt system, which probably developed as a result of Neoproterozoic (Pan-African) collision between the Congo and Kalahari cratons of the present Africa, and the Rio de la Plata craton of the present South America. The most prominent structure of the Kaoko belt is represented by the ~400 km long Purros shear zone (PSZ), which can be traced from southern Angola up to the Atlantic coast in central Namibia.

In the Purros area, the PSZ separates two distinct tectonic units differing in both structural and metamorphic evolution. East of the PSZ, the lithology is represented mostly by metasedimentary rocks with subordinate orthogneisses and migmatites. Mineral assemblages of metasediments show typical medium--pressure Barrovian succession with decreasing metamorphic grade towards the east (Gruner, 2000). The structural style is characterized by westward-dipping metamorphic foliation, later refolded by km-scale open folds. The orientation of the stretching lineation is WNW-ESE (Dürr and Dingeldey, 1996). West of the PSZ, the lithology is represented by ortho- and metasedimentary migmatites, and associated intrusive body of Amspoort-type porphyritic granite. The determination of protolith ages of orthomigmatites and orthogneisses provided Mesoproterozoic ages of about 1640, and 1514 ±0.7 Ma, respectively (Pb-Pb zircon evaporation method). The intrusion age of the Amspoort-type intrusion is Pan-African (550 ±1 Ma).

Structural and petrological investigations West of the PSZ in the Purros area have revealed three phases of deformation. The D1 phase is associated with the development of the westward-dipping S1 foliation, and the L1 stretching lineation plunging in the same direction. The S1 foliation is later refolded into km-scale, open to close F2 folds with axes moderately plung-