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**AGE OF THE TWO-MICA GRANITE
FROM THE STRZEGOM-SOBÓTKA MASSIF:
NEW DATA FROM U/PB MONAZITE AND XENOTIME STUDY**

GEOLOGICAL SETTING AND PREVIOUS GEOCHRONOLOGY

The Strzegom-Sobótka Granitoid Massif (SSM) is situated in the central part of the Fore Sudetic Block (Sudetes, NE part of the Variscan belt). It forms a NW-SE elongated zone, about 50 km long and up to ca. 20 km wide, mainly consisting of biotite monzogranite, two-mica monzogranite, biotite granodiorite and hornblende-biotite monzogranite (Majerowicz 1972, Pin et al. 1989, Puziewicz 1990). The different granitoids are believed to represent separate intrusions (Puziewicz, 1990).

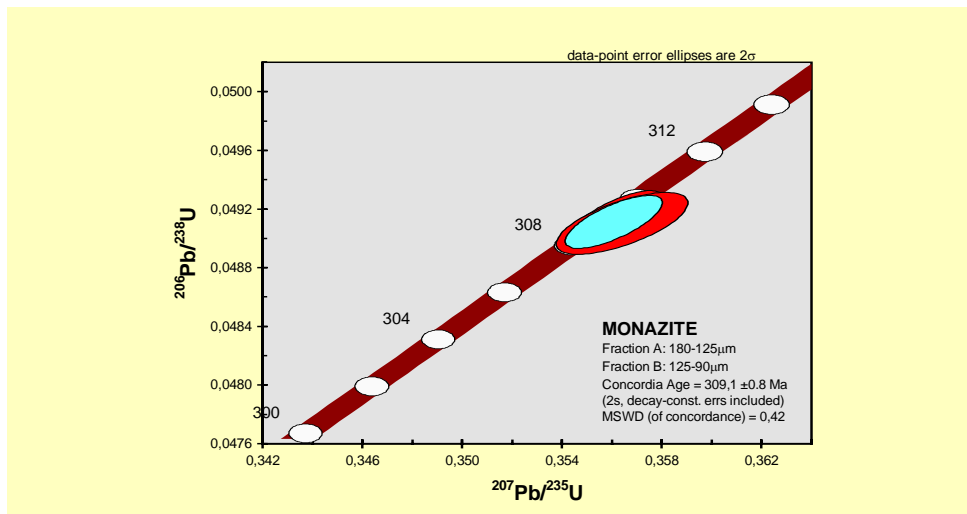
Previous geochronology has provided rough constraints for the timing of emplacement. Based on Rb-Sr whole rock dating, Pin et al. (1989) reported an age of ca. 330–325 Ma (± 22 Ma) for the two-mica granite and of ca. 290 Ma for the other main varieties. A biotite-whole rock pair of the two-mica granite from the Siedlimowice quarry yielded a Rb-Sr age of 324 ± 7 Ma. These authors concluded that emplacement of the two-mica granite was related to a late-syntectonic stage of the so-called “Sudetic phase”; intrusion of the other granites clearly is post-tectonic.

SAMPLE CHARACTERISTICS, RESULTS AND CONCLUSIONS

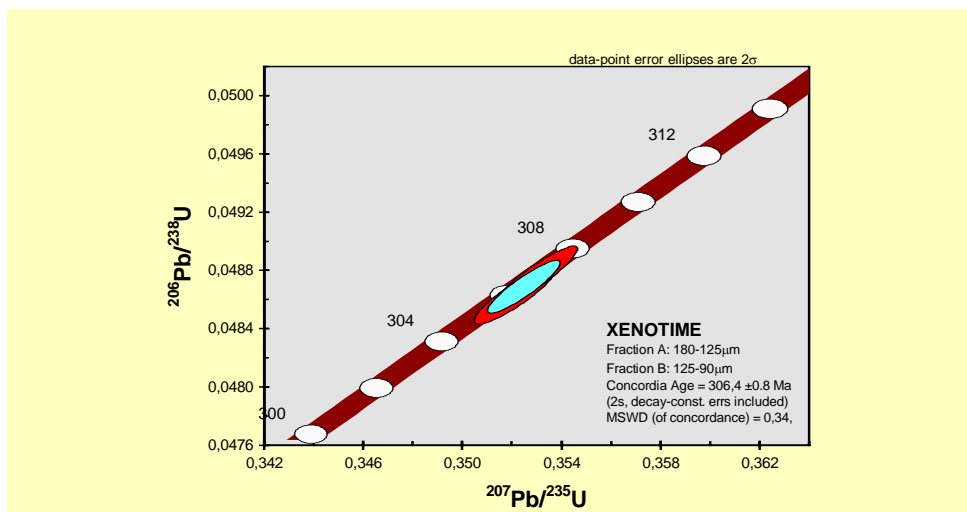
The two-mica granites are exposed in the central and SE parts of the SSM. A representative sample of fresh rock was collected from the working quarry near Siedlimowice village. This two-mica granite is a grey, medium grained rock with a weak planar fabric that is revealed by parallel arrangement of micas and quartz-mica enclaves. The mineral assemblage mainly consists of perthitic K-feldspar, plagioclase (10-11% An), quartz, muscovite, biotite. Typical accessories comprise garnet, apatite and zircon (Majerowicz, 1972). In addition, we have now recognized the presence of monazite and xenotime, which both are highly suitable for U-Pb geochronology. By use of the U-Pb multigrain technique, different grain-size fractions of these minerals were studied at the *Zentrallaboratorium für Geochronologie* in Münster (Germany).

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a)



b)

Fig. 1. Concordia diagram for monazite (a) and xenotime (b) from SS12 sample of two-mica granite from the Siedlimowice quarry

Both monazite and xenotime yielded similar, concordant U/Pb ages of 309.1 ± 0.8 Ma and 306.4 ± 0.8 Ma, respectively (Fig. 1.) which are interpreted as currently best estimate for the timing of emplacement. Similar ages, scattered around 310 Ma were previously reported in the West Sudetes for parts of the Karkonosze pluton (Duthou et al. 1991). The new data confirm previous interpretations suggesting that the two-mica granites are older than other granite types of the SSM. However, our study indicates that granite crystallization occurred in the late Westphalian and thus is younger than originally proposed by Pin et al. (1989).

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REFERENCES

- DUTHOU J.L., COUTURIE J.P., MIERZEJEWSKI M.P., PIN C., 1991: Rb/Sr age of the Karkonosze granite on the base of the whole rock method (in Polish). *Przegląd Geol.*, 2, 75-79.
- MAJEROWICZ A., 1972: Masyw granitowy Strzegom-Sobótka. Studium petrologiczne. On the petrology of the massif of Strzegom-Sobótka. *Geol. Sudetica*, 6, 7-96.
- PIN C., PUZIEWICZ J., DUTHOU J.L., 1989: Ages and origins of a composite granitic massif in the Variscan belt: a Rb-Sr study of the Strzegom-Sobótka Massif, W. Sudetes (Poland). *N. Jb. Miner. Abh.*, 160 (1), 71-82.
- PUZIEWICZ J., 1990: Masyw granitowy Strzegom-Sobótka. Aktualny stan badań. *Arch. Mineralog.*, 47 (2), 95-141.