

Pb nanospheres in metamorphic zircon

MONIKA A. KUSIAK¹, RICHARD WIRTH², DANIEL J.
DUNKLEY³, LEONID SHUMLYANSKY⁴, MARTIN J.
WHITEHOUSE⁵, SIMON A. WILDE⁴

¹Institute of Geophysics, Polish Academy of Sciences,
Warsaw, Poland; monika.kusiak@igf.edu.pl

²GeoForschungsZentrum, Section 3.6, Potsdam, Germany;

³Faculty of Natural Sci., Univ. of Silesia, Sosnowiec, Poland;

⁴School of Earth and Planetary Sci., Curtin Univ, Perth, WA

⁵Swedish Museum of Natural History, Stockholm, Sweden;

Metallic Pb nanospheres, first discovered in zircon from granulite facies rocks of the Napier Complex, Antarctica [1], have also been documented elsewhere in ultra-high temperature (UHT) rocks (Kerala Khondalite Belt [2]) and in granulites from the Ivrea-Verbano Zone [3]. If the Pb nanospheres were formed during high-T metamorphism from radiogenic Pb that accumulated over time metamorphic rims should contain no nanospheres. Zircon cores and metamorphic rims in samples from two localities of 3.7 Ga gneisses (Labrador [4] and Ukraine [5]) were examined. Tonalitic gneisses from Labrador were metamorphosed at 2.7 Ga and 2.5 Ga, whereas enigmatic quartzose rocks from the Odesa quarry, Ukraine, were metamorphosed at 2.8 Ga and 2.0 Ga. In both localities Pb nanospheres were found in metamorphic zircon of the earlier generation (2.7 Ga and 2.8 Ga, respectively). Hence, these were produced during later metamorphic events. The Pb nanospheres in the Ukrainian samples are extremely abundant and occur as both separate inclusions and in aggregates. The reason for these variations will be evaluated.

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[1] Kusiak *et al.*, 2015 *PNAS* **112**, 4958-4963. [2] Whitehouse *et al.*, 2017, *Miner Petrol* **111**, 467-474. [3] Kusiak *et al.*, 2019, *GCA* **292**, 20-30. [4] Kusiak *et al.*, 2018. *Chem Geol* **484**, 210-223 [5] Claesson *et al.* 2016. *Prec Res* **272**, 1-11.