MONAZITE AND RHABDOPHANE IN THE SOPRON HILLS, EASTERN ALPS (W-AUSTRIA)

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The crystalline rocks of the Sopron Hills represent the easternmost outcrop of the Austroalpine basement. Detailed investigations worked out the existence of two different lithological series within the Sopron Hills, whith different metamorphic history. 1) Lithologies with a relative well preserved pre-Alpine mineralogy comprise the Óbrennberg-Kaltes Bründl Series. In Bt-And-Sil Schists And shows Ky-overgrowth on its rims and in many samples the metastable co-existence of And, Sil, and Ky can be found. St only occurs as relicts within And. Bt-Ser-Cld-Grt-Schists are also frequent .2) The Sopron Series mainly consist of monotonous diaphtoritic mica schists with varying Qtz-contents and numerous rectangular to rhombic pseudomorphs after St. Characteristic coarse grained „Grobgneiss" was found only in the very southernmost part of the crystalline massif. Leucocratic, moderately foliated, medium-grained gneisses, which lack any transitions to the „Grobgneiss" are much more abundant.. The conditions of the pre-Alpine high-T metamorphism in the Óbrennberg-Kaltes Bründl Series are estimated at 650°C and 3-5 kbar. There is good evidence for an Alpine metamorphism in the Sopron Series, with peak-conditions at 550 ±30°C and 9,5 ± 1,5 kbar.

The occurrence and abundance of their accessory REE minerals were examined by EMPA. Monazite, xenotime and rhabdophane [$CePO_4 \cdot nH_2O$, $n \geq 0.5$] are rather widespread; allanite and florencite are scarce. Approx. 150 quantitative analyses were done on Mnz and rhabdophane, the distinction between them based on the measured oxide totals. – In the *schists* of *Óbrennberg–Kaltes Bründl Series* Mnz over 10 μm grain size is abundant (40-150 grain/section, with one exception). It is sometimes idioblastic, often included in And or intercalated with Bt suggesting formation – at least partly – during pre-Alpine metamorphism. It may be transformed partly or totally to rhabdophane in some samples, originating grains with appearance and chemistry similar with Mnz but oxide totals below 97% ("Mnz-like rhabdophane"). Other type of rhabdophane, see below, may also be present. – *Gneisses of Sopron Series* are poor in Mnz: one medium-grained gneiss has small inclusions in apatite, another in garnet. Rhabdophane, on the other hand, is abundant in some gneisses, forming heaps of small (≈1 μm) grains, with chemical compositions different from Mnz: Ca>Th; Y- and other HREE-, often Th-contents are higher. This type of rhabdophane is also present in some of the schists and must have different origin from Mnz-like rhabdophane. – In the *schists* (and quartzite) of *Sopron Series* the abundance of Mnz (or Mnz-like rhabdophane in one sample) is changing from 0 and 1 to 80 grain/section or more. The rocks with high abundance contain Cl-apatite as well.

In Mnz compositions the following changes were observed: a) nearly parallel change of Ca and Th (Ca≈Th); b) variation of Y and other HREE, presumably with P-T conditions ; c) differences in Eu-anomaly (Eu/Eu*) among grains of different origin.

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