

THE COOLING HISTORY OF THE SOUTHERN BOHEMIAN MASSIF

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The cooling history of the southern Bohemian Massif is established on numerous $^{40}\text{Ar}/^{39}\text{Ar}$ data. The data cover the Austrian part of the Massif and southern Czech Republic just north of the state border. With the exception of age values taken from the literature, most data have been gained by an automated argon extraction line. The computer programme is capable to perform a complete stepwise heating mass spectrometric analysis. Thus the analyses can be performed most efficiently in a short time.

We preferred data on muscovites rather than biotites for interpretation because the latter sometimes contain extraneous argon and yield higher ages than reasonable. In all cases the mineral ages date blocking temperatures, which are 500°C, 400–350°C, and 300°C for hornblende, muscovite, and biotite, respectively. Since most of the material was taken from intrusive bodies of granitic systems, late disturbances of the isotope system due to reheating effects can be excluded.

The metamorphic units of the Moravicum cooled off approximately at 330 million years. Weak influence of the Variscan metamorphism on rocks of the Dyje (and Brno) Pluton is documented by ages higher than 500 m.y. The Moldanubian units including granitic dykes and pegmatites which were emplaced after nappe stacking have muscovite and hornblende ages of the same age range around 330 m.y.

In the realm of the South Bohemian Pluton, rocks of the Central Moldanubian Pluton have the oldest cooling ages of all granite types so far investigated. These decrease from 328 m.y. in the North (Rácov and Mrákotín) to 320 m.y. around Gmünd and Schrems. A suite of late, sometimes P-rich muscovite-(biotite) granites, intruded mainly between 320 and 314 m.y. in Eisgarn type granites and cooled very fast, since the muscovite ages are close to the intrusion ages.

Two-mica-granites of the Šumava Mts. (Böhmerwald) are approximately 320 m.y. old and cooled to muscovite blocking temperatures 311–314 m. y. ago.

The ages of the blocks south of the Pfahl and Danube faults are considerably younger (around 290 m.y.). It seems that also the great NE - SW running faults control the exhumation process of the southernmost part of the composite pluton. The realm of Weinsberg type granite could be a deep crustal segment that passed the 350–400 °C range 310 m.y. ago. Alternatively, the granite remained hot for a long time due to continuing melt generation. These highly fractionated melts penetrated the granite frequently as small stocks.

From all these data the following age distribution pattern evolves: More or less uniform data around 330 m.y. prevail in the metamorphic terranes east of the large granite intrusions. In the areas built up by magmatites there is a remarkable drop in cooling ages from North (328 m.y.) to South and from East to West (290 m.y.).