

Zeitschrift: Schweizerische mineralogische und petrographische Mitteilungen =
Bulletin suisse de minéralogie et pétrographie

Band: 48 (1968)

Heft: 1: Symposium "Zone Ivrea-Verbano"

Artikel: Isotopic U-Ph ages of zircons from the Ceneri zone, Southern Alps

Autor: Pidgeon, R.T. / Köppel, V. / Grünenfelder, M.

DOI: <https://doi.org/10.5169/seals-37764>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 17.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

Isotopic U-Pb Ages of Zircons from the Ceneri Zone, Southern Alps

(Summary)

By *R. T. Pidgeon* *), *V. Köppel* and *M. Grünenfelder* (Zürich) **)

Six zircon samples from different rock types were analyzed isotopically for uranium and lead. One sample from an "orthogneiss", consisting of K-feldspar, biotite, plagioclase, quartz (REINHARD, 1964), and one sample from a paragneiss, consisting of plagioclase, biotite, quartz, \pm muscovite, \pm aluminosilicates, \pm K-feldspar, \pm hornblende (REINHARD, 1964), were large enough to be divided into different fractions by sieving and magnetic separations for the analyses.

The apparent U-Pb ages of zircons from the "orthogneiss" are almost concordant (433—546 my) and indicate a major event 420 to 440 my ago. It is believed that this event led to the formation of new zircons in these rocks and that it corresponds therefore in time to the major metamorphism of the higher amphibolite grade of the rocks in the Ceneri zone.

By sizing a large "orthogneiss" zircon sample into four different grain size fractions a small spread of their U content and U/Pb ratios was achieved. The three finer fractions with the highest U content and highest U/Pb ratios yielded almost concordant ages (433—462 my). The coarsest fraction with the lowest U content and lowest U/Pb ratio yielded somewhat higher apparent ages (445—546 my) which may be due to an inherited, pre-metamorphic Pb component of their U-Pb system. This interpretation is compatible with the observation that a few zircons contain cores of an older, rounded zircon generation.

The zircons of the paragneisses have suffered also a major lead loss during this metamorphism. No morphological evidence for the formation of new zircons was found. Their apparent ages (582—1364 my) are higher than those

*) Present Address: Scottish Research Reactor Centre, East Kilbride, Scotland.

**) Institut für Kristallographie und Petrographie, Eidg. Technische Hochschule, Sonneggstrasse 5, 8006 Zürich.

of the zircons from the "orthogneiss" samples. One zircon sample was divided by sieving and magnetic separations into eight different fractions seven of which were isotopically analyzed. The non-magnetic fractions show a regular increase of their U content and a decrease of the apparent ages with decreasing grain size. The magnetic fractions have a higher U content and still lower apparent ages, but do not exhibit the correlation between grain size, U content, and apparent ages found in the non-magnetic fractions.

The apparent ages indicate a minimum age of the primary source of the paragneiss zircons of 1600 to 1800 my.

The isotopic analyses of the zircons provided new information as to the time of the major metamorphism of the Ceneri zone as well as an insight into the premetamorphic history of the rocks.

A detailed paper on this subject will appear simultaneously with a paper by B. GRAUERT on zircon ages from the Silvretta and the Gotthard massif in "Contributions to Mineralogy and Petrology".

References

- REINHARD, M. (1964): Über das Grundgebirge des Sottoceneri im Süd-Tessin und die darin auftretenden Ganggesteine. Beitr. geol. Karte Schweiz, NF, 117. Lfg.