

Dabieshan Uhp Garnets Dated By $^{40}\text{Ar}/^{39}\text{Ar}$ Stepwise Crushing: More Early Paleozoic Ages

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$^{40}\text{Ar}/^{39}\text{Ar}$ dating of (U)HP metamorphic garnets from the Bixiling eclogite, Dabieshan terrane, east Central China [1] yield ~450 Ma ages despite profound metamorphic overprinting of the rocks in the Triassic [2]. These ages were measured on the fluid phase contained in the fluid inclusions of the garnet that was released by stepwise crushing.

The garnet stepwise crushing experiments consistently show evidence for three argon components (Fig. 1): 1. excess ^{40}Ar is liberated first from the larger more easily crushed inclusions, 2. radiogenic ^{40}Ar and 3. air argon. The latter two components originating from a less easily crushed reservoir dominate the age plateau and commonly form a mixing line between radiogenic argon and modern air when regressed.

New data measured on garnet from eclogites from Shuanghe, Ganghe and Hongmiao confirm the results from Bixiling: Excess argon released first, followed by a plateau and isochron ages of ca 450 Ma. We conclude that early Paleozoic ages are more common in Dabie Shan garnets. An UHP garnet from Altyn Tagh in western China of undisputed early Paleozoic age was used to validate the technique.

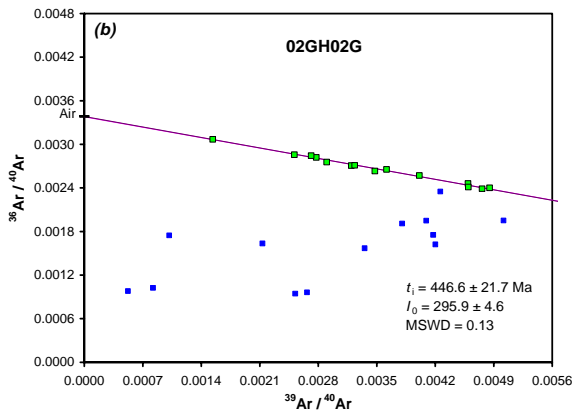


Fig. 1. Ganghe eclogite garnet, showing clear separation of excess argon (blue dots) and plateau (green dots)

References

- [1] Qiu H.N., Wijbrans J.R. (2006) *GCA* doi:10.1016/j.gca.2005.11.030
- [2] Chavagnac V., Jahn B.M.(1996) *Chem. Geol.* **133**, 29-51.