YBCs sanidine: A new standard for $^{40}Ar/^{39}Ar$ dating

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YBCs Sanidine

The $^{40}Ar/^{39}Ar$ dating technique is based on neutron fluence monitors (standards). Recent investigation demonstrates that currently used standards are not as homogenous as believed and new standards are needed[1]. In this study, we report a new sanidine standard, YBCs, collected from a phonolite at Yabachi in Tibet, China, for single-grain $^{40}Ar/^{39}Ar$ dating. Aliquots were distributed to four international laboratories for analysis and intercalibration.

Discussion and Results

The results show that YBCs crystals are homogenous in K content, $^{40}Ar^{*}/^{39}Ar_{K}$ (F-value) and age at the single grain level. The standard deviations of the F-value and age have small ranges from 0.29% to 0.53% and from 0.42% to 0.52%, respectively. These show that YBCs is a suitable standard for $^{40}Ar/^{39}Ar$ geochronology. The calibrated age of YBCs is 29.286±0.206 Ma, or neglecting the error in the decay constant, 29.286±0.045 Ma.

Finally, the intercalibration factors (which allow direct comparison between standards) between YBCs and FCs, GA1550, ACs and HB3gr are calculated as: = 1.044296±0.003968, = 0.291261±0.001148 = 24.443066±0.068432 and = 0.020312±0.000885. These values can be used to compare YBCs with other standards directly.

[1] Phillips, D. and Matchan, E.L., 2013. Ultra-high precision $^{40}Ar/^{39}Ar$ ages for Fish Canyon Tuff and Alder Creek Rhyolite sanidine: New dating standards required? *Geochimica et Cosmochimica Acta* **121**, 229–239.