The $^{40}Ar/^{39}Ar$ age and its significance of the crossite from the blueschists in the mid-Qiangtang Area, Tibet

1 Sampling background and dating means

THE blueschists in the mid-Qiangtang area are situated in Guoganjianian Mt., Qoum Mt., Naro, Qiagelela, etc. They are distributed east-westward, up to 300 km long. Their northern flank is the plate suture zone of Longmu Co-Shuanghu. The mother rocks of the blueschists are the late Carboniferous sandstones, siltstones, basalts, few sandwiching limestones, many ice-sea mix-conglomerates, etc.

The sample is taken from Naro which is 60 km to the west of Shuanghu. Its geographic coordinate is N30°13′, E88°14′. The height is 5 240 m above sea level. To the east and north of the sampling location there is a large area of granites. The sample has been systematically dated and researched on lithology, mineralogy, mineral-chemistry, etc. $^{40}Ar/^{39}Ar$ age of crossite from glaucophane marble is dated by fast-neutron activation analysis, with the decay constant, $\lambda = 5.543 \times 10^{-10}/a$.

2 Dating result and its significance

There are three groups of surfacing age data from 500 to 900℃, proving that inheritable ^{40}Ar exists on the surface of the minerals. The age (178.4 Ma) obtained from 900 to 1 050℃ shows that the blueschists experienced thermal agitation after having been formed. The age data from 178.4 to 186.0 Ma are obtained by Kr-Ar from the granites which invaded the blueschist, which prove that thermal agitation came from the magmatic activity in the late Indo-Chinese epoch. The aging spectral lines between 1 050 and 1 200℃ are horizontal, and unchangeable with the temperature. $t_p = (222.5 \pm 3.7)$ Ma, which stands for the forming age of the blueschists, and also represents the closing age of Longmu Co-Shuanghu suture. The age group of the blueschists also provides evidence for the comparison between Longmu Co-Shuanghu and Lancang River plate sutures. Rb-Sr plengite ages 240 and 260 Ma obtained from Huimin Fm. in the Menghai area are comparable to the forming age of the blueschists at the primary location.

Furthermore, researches and calculations on the mineralogy and lithology of the blueschists suggest the condition of 350—420℃ and 0.6—0.72 GPa for the formation of the blueschists. Combining this with the other geological data, the blueschists were formed under the condition of a short incomplete high pressure metamophism.

References

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