The results indicate that apophyllite is suitable for dating. However, the age values and their large scatter are unexpected.

In this study we present Rb-Sr, K-Ar and Ar-Ar measurements on apophyllite. The results indicate that apophyllite is suitable for dating. However, the age values and their large scatter are unexpected.

CONCLUSIONS

- Coinciding Rb-Sr and K-Ar age data for individual apophyllite samples indicate that apophyllite is suitable for geochronological dating.

- Ages between 20 and 58 Ma have been measured for apophyllites from different localities, but also within small areas large age scatter can be observed (25–49 Ma at Savaga near Jalgaon; 20–59 Ma in the surrounding of Nashik). Therefore apophyllite formed heterochronously within the Deccan volcanic Province and even within individual lava flows at certain localities.

- Investigations of fluid inclusions in apophyllite crystals from Jalgaon showed that homogenization temperatures are in the range of 140–230°C. These results are in line with literature data, indicating the formation of apophyllite, stilbite and heulandite at temperatures of about 100°C.

- The existing data support the following model for the formation of the secondary minerals: Meteoric water entered the basalt and caused hydrothermal formation of secondary minerals in cavities heterochronously between 58 and 20 Ma, depending on the locality, the individual lava flow and position within the lava flow. Early products (e.g. quartz, calcite, phyllosilicates) were formed during initial cooling but others (e.g. apophyllite, stilbite) formed during later local events of increased fluid activity and or recharging.

REFERENCES