

Abstract

This paper reviews the age and uranium-content equations using the fission track method. It was confirmed that the absolute age determinations with physical constants give a reasonably acceptable age when the external detector method is used for zircon, sphene and apatite standards. Several improvements adopted here are (1) to use appropriate geometry factors which were corrected for track registration thresholds of each mineral, (2) to monitor thermal neutron fluence based on the new dosimeter glass IRMM-540 pre-irradiated with well-known neutron fluence, and (3) to use the unique value of the decay constant ($8.5 \times 10^{-17} \text{y}^{-1}$). Uranium-contents measured for the standard materials showed good agreement with those determined by neutron activation analysis (NAA) and/or inductively coupled plasma mass spectrometer (ICPMS) methods. This suggests that the next-generation dating system that does not rely on a nuclear reactor is possible. A laser-abrasion-ICPMS is a candidate for automatic and grain-by-grain measurement of uranium-content in minerals.