NEW MODIFICATION OF 39AR-40AR LASER DATING METHOD (VIEW FROM PETROLOGY AND THERMOCHRONOLOGY)

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Isotopic measurements were conducted with the laser mass-spectrometric complex of IGEM RAS. As preparations we used special transparent sandwich thin sections (6*8*0.04 mm) with the underlying quartz glass and the built-in monitors of neutron flow. Such preparations contain small amount of substance and have low activity after irradiation. They are convenient for phase diagnosis in polarised light which allows controlling of homogeneity K-containing minerals, their crystalline orientation and diffusion loss of argon from core to the rim of the grains. Sandwich thin sections were cleaned in methanol before being wrapped in aluminium foil for irradiation. The other procedures of 39Ar/40Ar dating were standard. The samples received about 2*1018 neutrons/cm2 at the wet canal of the IRT reactor in Moscow and were loaded into the ultrahigh-vacuum laser port and heated to reduce atmospheric blank levels. Argon was extracted from small areas of mineral grains partially melted by YAG pulse infrared laser. The beam was directed into optic system of microscope LMA-1 and focused at the sample surface. Gases released by the laser were purified and sorbed on a cold carbon 'finger'. After heating the argon was allowed into MI1201 IG noble gas mass spectrometer and analysed statically on a faraday collector . Peaks between 35 and 41 were scanned 8 times and amounts extrapolated back to the inlet time. The resulting analyses were corrected for blanks, 39Ar decay and mass discrimination. The main results of measurement show a good correspondence to traditional method and advance petrological and isotope thermochronology.