Analytical Methods USGS Denver

Samples were collected from the field and sent to U.S. Geological Survey-Geology, Geophysics and Geochemistry Science Center, Denver, CO.

Zircon was separated from the rock using standard rock crushing and separation procedures. Hand-picked zircon grains were mounted in epoxy and subjected to cathodoluminescence (CL) imaging on the FEI Quanta 450 FEG scanning electron microscope at the USGS Microbeam Laboratory in Denver, Colorado.

LA-ICPMS U-Th-Pb data was obtained for the zircon grains using a Teledyne-Photon Machines Excite-Analyte(TM) 193 nm excimer laser and a Nu Instruments Attom(TM) high-resolution sector field ICPMS at the USGS-Denver G3 Plasma Lab. Laser ablation spot sizes were 25 um and the locations were chosen based on the zoning pattern of each grain as shown in the CL imaging as well as the absence of cracks, veins, and inclusions. Prior to analysis, the Laser Ablation: ICPMS system was tuned using National Institute of Standards and Technology (NIST) 610 glass to achieve optimal signal intensity, peak shape, and Th/U ratio. Primary reference material Temora2 (Black and others, 2004) as well as secondary reference materials Plesovice (Slama and others, 2008) and FC1 (Mattinson, 2010) were analyzed during the run.

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Ages were calculated using Iolite(TM) v. 2.5 (Paton and others, 2011) U-Pb geochronology Data Reduction Scheme (U_Pb_Geochronology3) using Temora2 (Black and others, 2004) zircon reference material.

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