

# **Petrogenesis and SHRIMP U-Pb geochronology of Neoproterozoic TTG gneisses from Bundelkhand Craton, North Central India: Implications for tectonic and crustal evolution at the Archean-Proterozoic transition**

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The Bundelkhand craton's oldest rock units are tonalite-trondhjemite-granodiorite gneisses (TTG). Paleoproterozoic magmatism in the Bundelkhand craton is recorded as four different events with zircon ages of 3.59 Ga, 3.44 Ga, 3.3 Ga, and 3.2 Ga, and a younger TTG magmatism phase of 2.71-2.69 Ga, reported in previous studies. This abstract reports high-resolution SHRIMP U-Pb zircon age and petrogenesis of the youngest Neoproterozoic TTG gneisses from the Bundelkhand craton.

The rocks have SiO<sub>2</sub> contents ranging from (71.61 to 73.45 wt %) and are generally rich in Al<sub>2</sub>O<sub>3</sub> (15.48 to 16.21 wt %), Na<sub>2</sub>O (4.85 to 5.35 wt %), and Na<sub>2</sub>O+CaO (7.65 to 8.64 wt %) with K<sub>2</sub>O/Na<sub>2</sub>O ratios varying from (0.46 to 0.48 ppm). In the Anorthite-Albite-Orthoclase (An-Ab-Or) normalized diagram, all samples plot in the trondhjemite field. All samples of TTG have high Sr/Y (22.35 to 48.70 ppm), (La/Yb)<sub>N</sub> varying from (8.83 to 34.80 ppm), and low to moderate europium anomaly with LREE enriched and HREE depleted pattern shows the similar to the Archean TTG gneisses. These results suggest that these rocks were generated by partial melting of the mafic crust, suggesting that TTGs are formed in an arc setting.

The zircon grains are euhedral to subhedral prismatic or long prismatic in shape with perfect oscillatory zoning. The size ranges from 110 to 250 μm, and the Th and U contents of analyzed grains range from 44 to 863 ppm and 114 to 1029 ppm, respectively, and Th/U ratios of all the spot analysis are greater than 0.1 except one grain 0.07 (avg. 0.52 ppm) which shows magmatic origin. An upper intercept age of 2555±8 Ma (n=6) in the concordia diagram is interpreted as the timing of TTG emplacement. A similar magmatic event resembles those in other Archean cratons such as the Aravalli craton, Bastar craton, Dharwar craton, and North China craton.