



U-Pb ID-TIMS zircon ages of TTG gneisses of the Aravalli Craton of India

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The crystalline basement of the Aravalli Craton is a heterogeneous assemblage dominated by granitic gneisses and granites with sporadic occurrences of amphibolites and dismembered sedimentary enclaves (Upadhyaya *et al.*, 1992). This assemblage is known to have experienced multiple deformation and metamorphic events followed by emplacement of voluminous granites and basaltic dykes. Based on Sm-Nd whole rock data on the basement Mewar orthogneisses of Jhamarkotra region (Gopalan *et al.*, 1990) and Pb/Pb ages of zircon from Gingla Granites which intrudes the basement (Wiedenbeck *et al.*, 1996), it has been inferred that the whole magmatic episode leading to the formation of the basement spanned from 3300 to 2400 Ma and that the Aravalli cratonic block had broadly stabilized by 2500 Ma on which the younger Aravalli and Delhi Supergroup unconformably deposited.

However, no comprehensive age data on the basement gneisses from the study area spanning the entire magmatic episode is available. This work attempts to provide a time frame work for evolution of the basement gneisses of the Aravalli Craton. We present here U-Pb zircon ages from the Precambrian basement TTG gneisses of the Aravalli Craton of north western India.

Pb and U were measured on multicollector Finnigan-MAT 262 mass spectrometer. The temperatures of measurements were 1300°C for Pb and 1500°C for U. Pb isotope ratios were corrected for mass fractionation with a factor of 0.10% per amu, based on repeat analyses of the standard NBS SRM 982. The U analyses were corrected for mass fractionation with a factor of 0.003% per amu, based on repeat analyses of the NBS U 500 standard. Reproducibility of the U-Pb ratios was determined from the repeated analysis of standard zircon IGF-87 (Ukraine) and taken as 0.5% for $^{207}\text{Pb}/^{235}\text{U}$ and $^{206}\text{Pb}/^{238}\text{U}$ ratios, respectively, at 95% confidence level. All calculations were done using the programs PBDAT and ISOPLOT (Ludwig 1991, 2008).

Four zircon fractions corresponding to four zircon types from UD-16 sample yield a U-Pb discordant age of 2680 ± 30 Ma. Two zircon fractions from UD-17 sample show discordant $^{207}\text{Pb}/^{206}\text{Pb}$ ages of 2506 and 2577 Ma. Zircons in our samples have moderate to high U contents (180-770 ppm) with low Th/U ratios (0.2-0.5) in the sample UD-16, characteristic for magmatic zircons from TTG rocks. Thus the obtained age of 2680 ± 30 Ma is interpreted as an age of magmatic crystallization of tonalites.

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