PETROLOGY AND GEOCHEMISTRY OF THE GRANITOID ROCKS FROM PARTS OF NORTH PURULIA SHEAR ZONE, CHOTANAGPUR GRANITE GNEISSIC COMPLEX, INDIA

The granitoid rocks exposed along the NPSZ of Chotanagpur Granite Gneissic Complex, West Bengal, are the focus of the present study. The granitoid rocks of the Raghunathpur-Bero area located to the north-eastern sector of Puruliya and Jhalda region located in the western part of Puruliya are mainly emphasized in the present study. Three granitoid varieties are observed in the north-eastern sector: garnetiferous granite gneiss (GGG), megacrystic granite gneiss (MGG) and pink granite (PG) while the western sector is mainly dominated by the megacrystic granite gneiss similar to that of north eastern sector with mounds of aegirine-ribeckite granite (ARG). Geochemically the granites of the Raghunathpur area are classified as ferroan, per-aluminous, S-type granites which were generated from the anatexis of meta-sedimentary protolith (khondalite) in a volcanic-arc to syn-collisional setting. On the other hand, the AR granites are ferroan, peralkaline granitoid rocks which shows similarities with A-type granites. They were supposed to be emplaced in a post orogenic setting during orogeny-anorogeny transition at the time of waning stage of orogenic activity. REE modeling of S-type granites of Raghunathpur area shows that 20-30% partial melting of khondalites under limited H_2O content condition at around 5kbar pressure give rise to the anatectic melt which may be considered as the parent melt of GGG. On the other hand, trace element modeling of the AR granitoids indicates that a moderate degree partial melting (5% to 20%) of charnockite+khondalite source rock followed by ~ 30% fractional crystallization of plagioclase feldspar is responsible to generate parent magma of alkali granite. Age data of the granitoids of Raghunathpur area and Jhalda area shows overlapping ages around 1000Ma. Occurrences of post orogenic / anorogenic granites in association with the orogenic I-type (megacrystic granite in Jhalda area) and S-type granites (Raghunathpur area) of similar or overlapping ages (1000 Ma) represents contrasting granite magmatism during orogeny-anorogeny transition in a Proterozoic orogenic belt of eastern India. Thus the 970 Ma Jhalda anorogenic granite of NPSZ confirm India's active participation in Rodinia event.

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