

## **GEOCHEMISTRY AND MINERALOGY OF THE RADIOACTIVE MINERALS ASSOCIATED WITH SOME PEGMATITE VEINS OF THE UKMA-NAWAHATU-HURSI SECTOR, PURULIA DISTRICT, W.B., IN THE PRECAMBRIAN CHHOTANAGPUR GNEISSIC COMPLEX**

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### **Abstract**

Some barite-bearing pegmatites in the Ukma-Nawahatu-Hursi sector (23° 25' -26' N, 86° 02' -04' E) in Purulia district, West Bengal, have association of radioactive minerals in the form of coarse-grained pitchblack lumps and irregular patches. The present author and his associates first reported the occurrence of this radioactive belt along a ENE-WSW shearzone during their fieldwork in November, 1978 (Baidya et. al., 1979). Groundborne radiometric survey and isorad mapping has established a radioactive high zone of about 15 km length running through Ukma, Nawahatu and Hursi areas. Mineralogical studies of the radioactive minerals have revealed the occurrence of Chevkinite, Aeschnite, Brannerite, Allanite, Uraninite, Tyuyamunite, Davidite, Euxenite, Samarskite, Thorutite, Autunite, Cerianite, in association with quartz, barite, microcline as the principal minerals and various minor minerals like biotite, vermiculite, hornblende, augite, orthoclase, celsian, muscovite, calcite, epidote, zoisite, ilmenite, sphene, rutile, hematite, magnetite, anatase, galena and sodic plagioclase. The barite-bearing pegmatites occur as lenses or lenticular veins hosted by garnetiferous sillimanite-biotite-quartz-schist or occasionally by migmatite. Near Nawahatu the radioactive barite-pegmatite vein occurs at or near the junction between the footwall amphibolite and hangingwall garnetiferous schist. The pegmatite veins have followed mainly schistosity of the host rock and dip at 70°-80° towards south. Chemical analyses of individual radioactive minerals by SEM-EDX and also of the bulk radioactive lumps by ICP-MS have shown significant concentration of U, Th and Rare earths. Minor and trace element analyses also record notable contents of Zr, Ga, Sc, Pb, Zn, Nb, Cu, Ni, V, Cr, As, W, Pd, Ag and Tl. Details of chemical analytical data are presented here. Chemically active fluids generated during metamorphism, metasomatism and granitic activity appear to have played a significant role in the formation of these pegmatites. Detailed exploration (geochemical, geophysical and geological) aided by excavation work (pitting, trenching and exploratory drilling) and chemical analyses for major, minor and trace elements is expected to reveal the feasibility status of these pegmatites as a possible U-Th-REE resource.

*Keywords:* Radioactive minerals-pegmatite-mineralogy-geochemistry-purulia.