

## GEOCHEMISTRY AND URANIUM POTENTIAL OF TIRATHGARH FORMATION, INDRAVATI BASIN, BASTAR DISTRICT, CHHATTISGARH, INDIA

Kamlesh Kumar<sup>1</sup>, Rahul Banerjee<sup>2</sup> and Deepak B Malpe<sup>3</sup>

*Atomic Minerals Directorate for Exploration and Research*

*<sup>1</sup>Western Region, Jaipur, <sup>2</sup>Begumpet, Hyderabad*

*<sup>3</sup>RTM Nagpur University, Nagpur*

*E-mail: kamleshkumar.amd@gov.in*

### Abstract

Tirathgarh Formation in the Mesoproterozoic Indravati Basin rests unconformably over deformed and metamorphosed Archaean to Palaeoproterozoic basement predominantly comprised of Darba Granite. This formation is mainly siliciclastic in nature with minor argillaceous intercalations and devoid of any carbonate rock. Geochemistry of the basal part of arenites closer to the unconformity shows high SiO<sub>2</sub> (94.02%) content, low TiO<sub>2</sub> (0.06%), Al<sub>2</sub>O<sub>3</sub> (3.16%), FeO<sup>T</sup> (1.34%), MgO (0.14%), MnO (0.01%), CaO (0.05%), Na<sub>2</sub>O (0.36%), K<sub>2</sub>O (0.68%) and P<sub>2</sub>O<sub>5</sub> (0.02%) content as compared to the Upper Continental Crust (UCC).

Integrated geological, radiometric and radon emanometry studies have resulted in the identification of uranium and radon anomalies while sub-surface drilling in target areas have confirmed the presence of concealed uranium mineralization (U-Cu-Zr-Cr) hosted in the basal part of Tirathgarh Formation along the unconformity. Extensive alteration due to the circulation of basinal fluids has also been observed along the mineralized zones. Possibility of migration of such fluids along fault zones to deeper parts in the basement cannot be ruled out. Exploration for uranium in this basin has resulted in the identification of uranium mineralisation in Tirathgarh Formation hosted in arenite and associated with unconformity and reactivated basement faults.

*Keywords:* Indravati Basin, Tirathgarh Formation, Geochemistry, Uranium, 'Unconformity-related' type.