

**Platinum-group element
geochemistry of Boradih ultramafic
intrusion from the Sonakhan
greenstone belt, Bastar craton**

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Ultramafic volcanic and intrusive rocks associated with Archean granite-greenstone belts are potential hosts for Platinum group element (PGE) deposits. In this study, we examined the PGE potential of an ultramafic intrusion from the Neoproterozoic Sonakhan greenstone belt (SGB) of the Bastar craton, Central India. The intrusion is primarily comprised of olivine, clinopyroxene, and chromite cumulates. The samples are characterized by low SiO₂ (37.3-41.1 wt%) high MgO (25.2-32.17 wt%) with varying Ni (120-1658 ppm) and Cr (362-2402 ppm) concentrations. Most of the samples exhibit elevated total PGE (Σ PGE > 100 ppb). Four samples show significantly higher Σ PGE (338-543 ppb) with relatively high total Platinum group PGEs (Σ PPGE = 292-496 ppb) (PPGEs; Pt, Pd, Rh) compared to the Iridium group PGEs (Σ IPGE = 32-52 ppb) (IPGEs: Ir, Ru, Os). The IPGEs, as well as the PPGEs, do not exhibit any significant correlations with Mg# (0.76-0.79). The chondrite normalized PGE patterns exhibit a higher abundance of PPGEs relative to the IPGEs, which indicates retention of IPGEs in the source mantle. The absence of significant correlations with Cu and low Cu/Pd (0.18-2.7) ratios indicates, lack of sulfide control over the PGE budget. A general positive correlation of PGEs with Cr and higher Pd/Pt (0.3-2.3) ratios indicate the influence of Cr-spinel (Cr# = 0.70-0.74; Mg# = 0.39-0.48) in the partitioning of PGEs. The presence of PGE enriched samples suggests the ultramafic unit of Sonakhan greenstone belt is a potential target for further prospecting.