

## **Chromite chemistry as an indicator of petrogenesis and tectonic setting: The good and bad**

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Chromite chemistry is used as a viable indicator to understand the petrogenesis and tectonic setting. Chromite composition in chromitites and serpentinites from Bondla and Kondapalli complexes from western and eastern peninsular India are studied and compared with other terranes.

Chromite cores from Bondla complex have 15-23 wt.%  $\text{Al}_2\text{O}_3$ , with Cr#  $[\text{Cr}/(\text{Cr}+\text{Al})]$  from 0.54-0.58 and 0.56-0.64, Mg#  $[\text{Mg}/(\text{Mg}+\text{Fe}^{2+})]$  from 0.56-0.67 and 0.41-0.63, in chromitites and serpentinites respectively. Chromite in serpentinites have strong chemical zoning with distinctive ferrian-chromite rims (Cr# 0.59-0.78, Mg# 0.01-0.47) and in massive chromitites are generally homogeneous. Chromites in chromitites from Kondapalli layered complex have 13–19 wt.%  $\text{Al}_2\text{O}_3$ , Cr# 0.58–0.71 and Mg# 0.30–0.40. Composition of chromite cores from Bondla and Kondapalli complexes indicate supra-subduction zone arc setting derivation, however rims from serpentinites and disseminated chromitites indicate different tectonic settings.

Calculated parental magma composition is similar to a modern primitive tholeiitic basalt formed by high degree of mantle melting and parental melt composition is equivalent to that of an island-arc tholeiite (IAT).

The results are compared with other terranes and found that several post-magmatic factors can also affect the chromite chemistry and lead to misinterpretation of tectonic setting. Due to sub-solidus re-equilibration during cooling, hydrothermal activity or many other factors chromite can show core-rim, insitu-detrital, massive-disseminated textural and host-rock based compositional variations, even though derived from a similar tectonic setting. Hence, considering the post-magmatic effects, metamorphism/alteration factors and determining the extent of compositional change is important before using chromite chemistry for petrogenesis and discrimination of tectonic setting.