

## Alkaline rocks and diamonds in the Eastern Andes of Bolivia

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Alluvial diamonds were recently found near Independencia in the Ayopaya Province of Cochabamba, Bolivia. Reconnaissance work defines an alkaline rock sequence ranging from syenites, nepheline syenite/foyaite intrusions to carbonatites, alkaline lamprophyres, melilithites and ultramafic breccia bodies. Alkali-rich hydrothermal vein systems with the mineral assemblage of sodalite-ankerite-baryte are associated with this rock suite.

The source for the alluvial diamonds are probably small-scale diatreme-like breccia-bodies of ultramafic lamprophyres with a macrocryst assemblage of olivine, clino- and orthopyroxene, nepheline, feldspar, chromite, ilmenite, phlogopite, perowskite and melanite in a heterogeneous, fine grained groundmass of phlogopite, carbonate, serpentine and volcanic glass. The xenolith suite consists of sedimentary hostrock, igneous rocks, crystalline basement rocks, and mantle-derived lherzolites and wherlites. Contamination by sodalite-bearing syenite xenoliths causes a high-Na composition (3.3-6.0 wt% Na<sub>2</sub>O). The carbonatite bodies are enriched in LREE and have locally high Nb contents.

Nd isotope data indicate a lithospheric mantle source for the alkaline suite ( $\epsilon_{\text{Nd}}$  1.7-4.3). The alkaline magmatism is related to Cretaceous rifting and is probably part of large-scale fragmentation of the South American lithosphere during the opening of the southern Atlantic Ocean.