

# **High-K calc-alkaline diorites of the Borborema Province, northeastern Brazil: geochemistry of the lithospheric mantle and implications for the terrane concept**

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The Borborema Province, Northeast Brazil, is interpreted in recent works as a collage of terranes accreted during the Cariris Velhos (Meso- to Neoproterozoic) and Brasiliano (late Neoproterozoic) events. To test this hypothesis, dioritic rocks of the high-K calc-alkaline association, which has a widespread geographic distribution, were used as probes to infer the geochemical characteristics of the lithospheric mantle beneath this province. These rocks are enriched in K<sub>2</sub>O (2.0 to 5.8 wt. %), MgO (1.9 to 6.4 wt. %) and CaO (4.0 to 8.0 wt. %), have moderate to high Ba (800 to 2800 ppm) and Sr (600 -1100 ppm), low to intermediate Rb (60 to 200 ppm), and high LREE/HREE ratios. These geochemical signatures point to an origin by partial melting of an anomalous, LILE enriched, metasomatized lithospheric mantle.  $\epsilon$ Nd (600 Ma) values in seven widely separated plutons are very negative (-7 to -16). They have Sm-Nd model ages of 1.8 to 2.0 Ga, indicating that the main metasomatic event occurred during the Transamazonian (ca 2.0 Ga ) tectonic cycle.

The very restricted geochemical and isotopic variation among diorites indicates that a large continental lithospheric tract was established after the Transamazonian cycle. Therefore, some of the segments of the Borborema Province interpreted as different tectonostratigraphic terranes resulted from deformation of intracontinental volcano-sedimentary successions, rift-related granites and preexisting crust during the Brasiliano event.