

High $\delta^{18}\text{O}$ oceanic crust-derived diorites in the high-K quartz monzonite Tavares batholith, northeastern Brazil

V. P. FERREIRA^{1*}, J. W. VALLEY², A. N. SIAL¹,
R. J. R. PESSÔA¹ AND M. SPICUZZA²

¹NEG-LABISE, Dept. Geology, UFPE, Recife, Brazil

(*correspondence: valderez@ufpe.br)

²Dept. of Geosciences, University of Wisconsin, Madison, USA

The 651Ma Tavares pluton is a high-K calc-alkalic, metaluminous, magmatic epidote-bearing quartz monzonite batholith, intrusive into Mesoproterozoic orthogneisses in the Alto Pajeú belt, northeastern Brazil. This pluton exhibits snail structures, diorite as co-magmatic enclaves, syn-plutonic and ladder dikes, and carries tightly-folded banded epidote amphibolite xenoliths up to 1m in length. These Cr- (up to 1200 ppm) and Ni- (up to 360 ppm) enriched xenoliths display chemistry compatible to that of intraplate low-K oceanic basalts. They exhibit fractionated chondrite-normalized REE patterns, overlapping those of the host quartz monzonite and diorite enclaves and lack Eu anomaly. Initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios for the quartz monzonite vary from 0.70779 to 0.70938, and $\epsilon\text{Nd}(0.6\text{Ga})$ from -3.2 to -3.4, with t_{DM} ages from 1.4 to 1.3 Ga. Values of $\delta^{18}\text{O}$ (zircon) from the quartz monzonite average $+9.1 \pm 0.1\text{‰}_{\text{VSMOW}}$ (n=8), and calculated w.r. rock is of $10.8 \pm 0.1\text{‰}_{\text{VSMOW}}$. Values of $\delta^{18}\text{O}$ for epidote and quartz of the amphibolites (8.54; 12.66‰) are similar to those of the host quartz monzonite (8.04; 13.14‰) and diorite (8.32; 12.94‰). These data suggest that the amphibolite xenoliths are portions of the source rock for the diorite magma whose underplating in the base of the lower crust has led to partial melting and formation of the quartz monzonite source magma. The high $\delta^{18}\text{O}$ values for the amphibole (metabasalt) xenolith could be due to low-T ^{18}O isotopic interaction with oceanic water.