

Geochemistry of metaigneous rocks of the northern Appalachian Taconian peri-Laurentian and oceanic collisional margin, Vermont to New York

RATCLIFFE, N.M., USGS retired, Box 189, Waterford, VA 20197; DIETSCH, Craig, Geology Department, University of Cincinnati, Cincinnati, OH 45211-0013; MERGUERIAN, Charles, Duke Geological Lab, 55 Spongia Road, Stone Ridge, NY 12484-5510; WALSH, G.J., USGS, 87 State St., Montpelier, VT 05602, and MICHEL, Andrew, Geology Department, University of Cincinnati, Cincinnati, OH 45211-0013; Ratcliffe2@gmail.com

Neoproterozoic to Cambrian Laurentian-margin volcanic rift- to drift- sequence rocks such as the Hoosac and Pinney Hollow Formations, and Taconic allochthons contain metabasalts indicative of continental rifting. Abundant arc volcanics and ultramafic slivers in the Rowe Schist (RS) and Moretown Formation (MF) from Vermont to New York are considered to generally mark the western limit of the Taconian accretionary wedge emplaced upon the Laurentian margin along a series of thrust faults. In Connecticut, the RS marks the base of accreted margin and the Hoosac is equated with the parautochthonous Manhattan Formation. In this scenario, metabasalts of the Manhattan should match rift volcanics in the Hoosac and differ from arc and ocean floor rocks in western Connecticut and east of Cameron's Line (CL). We compare the geochemistry of volcanic rocks of the autochthonous Hoosac and the Taconic allochthons (TA) with volcanic rocks in Manhattan Schist and volcanics of the accretionary wedge east of CL and in Vermont. The Hoosac Formation in Vermont and Massachusetts rests nonconformably on Laurentian crust and contains metabasalts of the rifted margin. Two groups in the Hoosac are evident: (A) high TiO_2 , low MgO, high La 80 times chondrite, and (B): lower TiO_2 , higher MgO and La 8 to 30 times chondrite. Group A occurs near the base of the Hoosac. Group B becomes more MORB-like at higher stratigraphic levels. Group A resembles closely metabasalts of the (TA) and dikes within the Mount Holly Complex. Group B is comparable to metabasalts of the Pinney Hollow and Ottauquechee and Rowe at their type localities. Mafic and felsic igneous rocks of North River Igneous Suite (502 to 483 Ma) in the Moretown Formation of southern Vermont are early arc composed of metatrandjemite, metadacite, and andesitic metabasalts typical of the accreted Taconian margin. We find that Manhattan metabasalts have similar REE and trace element characteristics as the Hoosac A and B groups, but that rocks east of CL in Connecticut are more uniformly oceanic. These data suggest that the accreted margin contains both peri-Laurentian and Iapetan components and only approximates a suture. Stanley and Ratcliffe (1985) called this a cryptic suture because of tectonic intercalation of continent derived metasediments and arc-ocean floor components during collision.

To Cite This Abstract (# 310735):

Ratcliffe, N.M.; Dietsch, Craig; Merguerian, Charles; Walsh, G.J.; and Michel, Andrew, 2018, Geochemistry of metaigneous rocks of the northern Appalachian Taconian peri-Laurentian and oceanic collisional margin, Vermont to New York (abs.): Geological Society of America Abstract with Programs, v. x, no. x, p. xxx.