

## Petrochemistry, petrology, geochronology and *P-T* estimation of the Devrekani (Kastamonu, N Turkey) Massif

M. A. GUCER<sup>1\*</sup> AND M. ARSLAN<sup>2</sup>

<sup>1</sup>Dept. of Geol. Eng., Gümüşhane Univ., 29100-Gümüşhane, Turkey (\*correspondence: maligucer@gmail.com)

<sup>2</sup>Dept. of Geol. Eng., Karadeniz Tech. Univ., 61080-Trabzon, Turkey (marslan@ktu.edu.tr)

The Devrekani (Kastamonu, N Turkey) massif, located at the Sakarya zone in the central Pontides, contains various metamorphic rocks. The petrography, petrochemistry, petrology, geochronology and metamorphic evolution of the massif, including amphibolite, orthogneiss, paragneiss, metacarbonate and quartzite were investigated. The amphibolites and gneisses are mainly composed of hornblende (Mg#: 0.48-0.74), clinopyroxene (Wo<sub>46-52</sub>En<sub>35-38</sub>Fs<sub>11-18</sub>), plagioclase (An<sub>05-98</sub>), quartz, biotite (X<sub>Ann</sub>: 0.33-0.49, X<sub>Phl</sub>: 0.24-0.52; Mg#: 0.33-0.59), garnet (Alm<sub>43-80</sub>Grs<sub>0-18</sub>Prp<sub>5-23</sub>And<sub>0-4</sub>Sps<sub>10-33</sub>), K-feldspar (An<sub>0-1</sub>Ab<sub>3-26</sub>Or<sub>73-96</sub>), cordierite (Mg#: 0.33-0.71), sillimanite, hercynite and Fe-Ti oxide. The mineralogical assemblages reflect characteristics of sillimanite zone, upper grade amphibolite-lower grade granulite facies and Barrovian-type *MP/HT* metamorphism. Thermobarometry calculations show 6±1.25 kbar, 775±25°C ( $P_{max}$ : 8.62 kbar,  $T_{max}$ : 827±22°C) and 20-22 km depth. Petrochemical data suggests that amphibolites, orthogneisses and paragneisses were derived from protoliths of island arc tholeiitic basalt, I-type calc-alkaline volcanic arc granitoid; shale-wackestone characterizing active-passive continental margin, respectively. The metamorphics have  $^{87}\text{Sr}/^{86}\text{Sr}= 0.708914-0.734935$ ,  $^{144}\text{Nd}/^{143}\text{Nd}= 0.512149-0.51299$  ratios,  $\epsilon\text{Nd}_i= (-9.54)-(+6.89)$  values and  $T_{DM}= 1.27-1.85$  Ga. Based on U-Pb zircon dating data, protoliths are related with Paleozoic and pre-Paleozoic (668-293 Ma) province and Permo-Carboniferous (316-252 Ma) magmatism. Besides, the peak metamorphism could have taken place during the Jurassic time regarding to U-Pb zircon (199-158 Ma) and  $^{40}\text{Ar}-^{39}\text{Ar}$  hornblende/biotite (192-153 Ma) dating. Conclusively, Devrekani massif can be ascribed as products of Jurassic continental extensional arc metamorphism in Central Pontides.