

Discrimination of subduction components with B and Be systematics in the Aeolian Island Arc, Italy

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The Aeolian Arc volcanoes (southern Tyrrhenian Sea, Italy) are characterized by strong west to east variations in incompatible elements and radiogenic isotopes, likely related to a heterogeneous source and variations in the subduction components. We provide new B and Be data for the islands Alicudi, Filicudi, Salina, and Stromboli, with the aim of distinguishing subducting components that metasomatize the mantle wedge. B is a highly fluid-mobile element, enriched in Stromboli lavas (11-30.3 ppm) and moderately enriched in Salina (8.3-20.3 ppm) compared to the other islands (3.8-14.6 ppm). Be is a melt mobile element, which content increases with increasing distance from the center of the arc to the margins. We observed a correlation between Be contents and magma composition in Stromboli's samples, which allowed us to distinguish calc-alkaline from potassic series. Based on the differences along the arc between fluid/melt mobile element ratios (e.g. B/Nb, Sr/Zr and U/Th) and Be contents, we suggest that aqueous fluids from the subducting slab dominate the chemical composition of the central arc section (Salina) while a melt component from subducted sediments may play a key role in metasomatizing the mantle wedge below the peripheral islands. Specifically for Stromboli the high B and Be contents suggest contributions from both silicate melts and aqueous fluids.