

Electronic supplement/Appendix B: Detailed references for geochemical data in Figure 4-6.

Aegean Arc:

- Buettner, A., Kleinmanns, I.C., Rufer, D., Hunziker, J.C., Villa, I.M. 2005. Magma generation at the easternmost section of the Hellenic Arc: Hf, Nd, Pb and Sr isotope geochemistry of Nisyros and Yali volcanoes (Greece). *Lithos*, 83, 29-46.
- Vespa, M., Keller, J., Gertisser, R., 2006. Interplinian explosive activity of Santorini volcano (Greece) during the past 150000 years. *J Volcanol Geotherm Res*, 153, 262-286
- Zellmer, G.F., Turner, S.P. 2007. Arc dacite genesis pathways evidence from mafic enclaves and their hosts in Aegean lavas. *Lithos*, 95, 346-362

Aeolian Arc:

- Francalanci L., Taylor, S.R., McCulloch, M.T., Woodhead, J.D., 1993. Geochemical and isotopic variations in the calc-alkaline rocks of Aeolian Arc, Southern Tyrrhenian Sea, Italy: Constraints on magma genesis. *Contrib Mineral Petrol*, 113, 300-313
- Laiolo, M., Cigolini, C., 2006. Mafic and ultramafic xenoliths in San Bartolo lava field: New insights on the ascent and storage of Stromboli magmas. *Bull Volcanol*, 68, 653-670
- Landi, P., Metrich, N., Bertagnini, A., Rosi, M., 2004. Dynamics of magma mixing and degassing recorded in plagioclase at Stromboli (Aeolian Archipelago, Italy). *Contrib Mineral Petrol*, 147, 213-227.

Aleutian Arc:

- Class, C., Miller, D.M., Goldstein, S.L., Langmuir, C.H., 2000. Distinguishing melt and fluid subduction components in Umnak volcanics, Aleutian Arc. *G-cubed*, 1, 1999GC000010.

Bismarc Arc:

- Taylor, S.R., Capp, A.C., Graham, A.L., Blake, D.H., 1969. Element abundances in andesites II. Saipan, Bougainville and Fiji. *Contrib Mineral Petrol*, 23, 1-26
- Woodhead, J.D., Eggins, S.M., Johnson, R.W., 1998. Magma genesis in the new Britain Island Arc: Further insights into melting and mass transfer processes. *J Petrol*, 39, 1641-1668

Central American Volcanic Arc (CAVA):

- Bolge, L.L., Carr, M.J., Feigenson, M.D., Alvarado, G.E., 2006. Geochemical stratigraphy and magmatic evolution at Arenal Volcano, Costa Rica. *J Volcanol Geotherm Res*, 157: 34-48.

Chan, L-H., Leeman, W.P., You, C-F., 1999, Lithium isotopic composition of Central American Volcanic Arc lavas: Implications for modification of subarc mantle by slab-derived fluids. *Chem Geol*, 160, 255-280

Noll, P.D., Newsom, H.E., Leeman, W.P., Ryan, J.G., 1996. The role of hydrothermal fluids in the production of subduction zone magmas: Evidence from siderophile and chalcophile trace elements and boron. *Geochim Cosmochim Ac*, 60, 587-611.

Honshu Arc:

Kimura, J-I., Manton, W.I., Sun, C-H., Iizumi, S., Yoshida, T., Stern, R.J., 2002. Chemical diversity of the Ueno Basalts, Central Japan: Identification of mantle sources and crustal contributions to arc basalts. *J Petrol*, 43, 1923-1946

Izu-Bonin Arc:

Haraguchi, S., Ishii, T., Kimura, J-I., 2008. Early tholeiitic and calc-alkaline arc magmatism of middle to late Eocene age in the Southern Ogasawara (Bonin) forearc. *Contrib Mineral Petrol*, 155, 593-618

Kamchatka Arc:

Bindeman, I.N., Bailey, J.C., 1994. A model of reverse differentiation at Dikii Greben Volcano, Kamchatka: Progressive basic magma vesiculation in a silicic magma chamber. *Contrib Mineral Petrol*, 117, 263-278

Dirksen, O., Humphreys, M.S.C., Pletchov, P., Melnik, O., Demyanchuk, Y., Sparks, R.S.J., Mahony, S. 2006. The 2001-2004 dome-forming eruption of Shiveluch Volcano, Kamchatka: observation, petrological investigation and numerical modelling. *J Volcanol Geotherm Res*, 155, 201-226

Dosetto, A., Bourdon, B., Joron, J-L., Dupre, B., 2003. U-Th-Pa-Ra study of the Kamchatka Arc: New constraints on the genesis of arc lavas. *Geochim Cosmochim Ac*, 67, 2857-2877.

Duggen, S., Portnyagin, M.V., Baker, J.A., Ulfbeck, D.G., Hoernle, K., Garbe-Schönberg, C-D., Grassineau, N., 2007. Drastic shift in lava geochemistry in the volcanic-front to rear-arc region of the Southern Kamchatkan subduction zone: evidence for the transition from slab surface dehydration to sediment melting. *Geochim Cosmochim Ac* 71, 452-480.

Kermadec Arc:

Ewart, A., Bryan, W. B., Chappell, B.W., Rudnick, R.L., 1994. Regional geochemistry of the Lau-Tonga Arc and back-arc systems. *Proc Ocean Drill. Program Scient Results*, 135, 385-425

Smith, I.E.M., Stewart, R.B., Price, R.C. 2003. The petrology of a large intra-oceanic silicic eruption: the Sandy Bay tephra, Kermadec Arc, Southwest Pacific. *J Volcanol Geotherm Res*, 124, 173-194

Mariana Arc:

Stern, R.J. Kohut, E.J., Bloomer, S.H., Leybourne, M.I., Fouch, M., Vervoort, J. 2006. Subduction factory processes beneath the Guguan cross-chain, Mariana Arc: No role for sediments, are serpentinites important? *Contrib Mineral Petrol*, 151, 202-221

New Hebrides-Vanuatu Arc:

Barsdell, M., Smith I.E.M., Spoerli, K.B., 1982. The origin of reversed chemical zoning in the Northern New Hebrides Volcanic Arc. *Contrib Mineral Petrol*, 81, 148-155

Raos, A.M., Crawford, A.J. 2004. Basalts from the Efate Island Group, central section of the Vanuatu Arc, SW Pacific: Geochemistry and petrogenesis. *J Volcanol Geotherm Res*, 134, 35-56

Scotia Arc:

Arevalo, R., McDonough, W.F., 2008. Tungsten geochemistry and implications for understanding the Earth's interior. *Earth Planet. Sci. Lett.*, 272, 656-665.

Sunda Arc:

Reubi O., Nicholls, I.A., 2004. Magmatic evolution at Batur Volcanic Field, Balim Indonesia: Petrological evidence for fractional crystallization and implications for caldera-forming eruptions. *J. Volcanol Geotherm Res*, 138, 345-369

Reubi, O., Nicholls, I.A., Kamenetsky V.S., 2002. Early mixing and mingling in the evolution of basaltic magmas: evidence from phenocryst assemblages, Slamet Volcano, Java, Indonesia. *J Volcanol Geotherm Res*, 119, 255-274

Tonga Arc:

Arevalo, R., McDonough, W.F., 2008. Tungsten geochemistry and implications for understanding the Earth's interior. *Earth Planet. Sci. Lett.*, 272, 656-665.

Ewart, A., Bryan, W. B., Chappell, B.W., Rudnick, R.L., 1994. Regional geochemistry of the Lau-Tonga Arc and back-arc systems. *Proc Ocean Drill. Program Scient Results*, 135, 385-425

Taylor, S.R., Capp, A.C., Graham, A.L., Blake, D.H., 1969. Element abundances in andesites II. Saipan, Bougainville and Fiji. *Contrib Mineral Petrol*, 23, 1-26