

Global distribution of volcanism and its connection with lithospheric plate boundaries

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Annotation

The report discusses:

- The contemporary global geographic distribution of volcanism and its association with lithospheric plate boundaries;
- Methods for identifying volcanics formed under different geodynamic conditions;
- Petrochemical and geochemical parameters of volcanics formed under varying geodynamic settings.

References

1. Black S., Burton K., Harris N., Parkinson I., Rogers N., Widdowson M. Our Dynamic Planet, Rogers, N ed, Cambridge University Press, 2008, 390 p
2. Bradshaw T., Hawkesworth C.J, Gallagher K. Basaltic volcanism in the southern Basin and Range: No role for a mantle plume. *Earth and Planetary Sciences Letters*, v.116, 1993, p.45-62. doi:10.1016/0012-821X(93)9D;
3. Elthon D., & Scarfe C. High pressure phase equilibria of a high-magnesia basalt and the genesis of primary oceanic basalts. *Am. Mineral*, 69, 1984, p. 1-15
4. Forsyth D. W. 1996. Partial melting beneath a mid-Atlantic segment detected by teleseismic PKP delays. *Geophysical Research Letters*, 23, 1996, p. 463–466
5. Hofmann A.W. Sampling mantle heterogeneity through oceanic basalts: Isotopes and trace elements. In: Carlson R.W.(ed), *Treatise on Geochemistry*, v. 2, The Mantle and Core, Elsevier, 2003, p.61–101, doi:10.1016/B0-08-043751-6/02123-X.
6. Holmes A. Radioactivity and the Earth's thermal history. *Geological Magazine*, 62, 1931, p. 102-112.
7. Kelemen P., Hanghøj., Greene A. One view on the geochemistry of subduction-related magmatic arcs, with an emphasis on primitive andesite and lower crust. In: Holland, H.D., Turekian, K.K. eds., *Treatise on Geochemistry*, Elsevier, Oxford, vol. 2, 2007, p. 593–659.
8. Kent C. Condie. *Earth as an evolving planetary system*. Academic Press is an imprint of Elsevier., 2005, 463p.
9. Lei J. & Zhao, D. A new insight into the Hawaiian plume. *Earth and Planetary Science Letters*, v. 241, 2006, p. 438-453.

10. Marsh B. Magmatism, Magma, and Magma Chambers. In: Treatise on Geophysics - Crust and Lithosphere Dynamics, 2009, p. 275-331.
11. Morgan W. Convection plumes in the lower mantle. *Nature*, 230, 1971, p. 42-45
12. Pearce J. & Peate, D. Tectonic Implications of the Composition of Volcanic ARC Magmas. *Annual Review of Earth and Planetary Sciences* Vol. 23, 1995, p. 251-285
13. Perfit M., Fornari D., Smith M., Bender J., Langmuir C. Haymon R. Small-scale spatial and temporal variations in MORB geochemistry and implications for ridge crest magmatic processes. *Geology*, 22, 1994, p. 375-379.
14. Schmincke H.-U. *Volcanism*. Springer-Verlag Berlin Heidelberg New York, 2004, p. 324.
15. Thompson R. N., & Gibson, S. A. Magmatic expression of lithospheric thinning across continental rifts. *Tectonophysics*, 233, 1994, p. 41-68.
16. Van der Hilst R., & Karason H. Compositional heterogeneity in the bottom 1000 kilometers of Earth's mantle: Toward a hybrid convection model. *Science*, 283, 1999, p. 1885-1888.
17. Wegener A. Die Herausbildung der Grossformen der Erdrinde (Kontinente und Ozeane), auf geophysikalischer Grundlage. *Petermanns Geographische Mitteilungen*, 63, 1912, p. 185-195, 253- 256, 305-309.
18. Wilson J. Possible origin of the Hawaiian Islands. *Canadian Journal of Physics*, v.41, 1963, p. 863-870.
19. Wilson M. Geochemical signature of oceanic and continental basalts: a key to mantle dynamics. *Journal of the Geological Society*, 150, 1993, p. 37-58.
20. <https://www.volcanos/global/distribution>