
**Magma evolution in the Pliocene – Pleistocene
succession of Kos, South Aegean arc:
petrographic evidence for magma mixing**

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The island of Kos is the most easterly volcanic centre of the Pliocene-Quaternary South Aegean arc, related to the subduction of the African plate beneath the Aegean microplate. Pliocene and early Pleistocene volcanism is represented by dacite flows and rhyolite domes. The mid Pleistocene Kefalos tuff

has abundant lithic clasts of magmatic rocks. The 0.16 Ma Kos Plateau Tuff, derived from andesite stratocone now subsided beneath the sea south of Kos, also has abundant lithic clasts.

Lavas, mafic enclaves from more felsic rocks, and lithic clasts from pyroclastic rocks have been examined by petrographic microscope and electron microprobe. The rocks examined range from andesite to rhyolite in composition. Plagioclase is commonly complexly zoned, with corroded and embayed cores, spongy cellular zones, and calcic spikes. Ovoidal quartz is mantled by clinopyroxene crystals and has trapped glass inclusions with a range of compositions. Complexly zoned clinopyroxene is in places overgrown by boxy cellular orthopyroxene. Andesite contains quenched accessory acicular apatite and glass inclusions are found in some plagioclase.

Sr and Nd-Sm isotope determination show mantle values in all rock types, from andesite to rhyolite. Andesite magma may have been generated by remelting crust underplated with mantle-derived magma during regional mafic plutonism in the Miocene. Episodic replenishment of a fractioning magma chamber would account for the observed mixing textures and the triggering of explosive eruptions.