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The Campi Flegrei magmatic system: structure and evolution.

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Campi Flegrei magmas originated in MORB-like mantle source, previously metasomatised by fluids/melts deriving from sediments of the Adria-Ionian subducting slab. The metasomatic process progressively chenges the source composition of the Neapolitan volcanism eastwards from Ischia-Procida to Campi Flegrei and Vesuvius. Magmas erupted between 40-60 ka in the Campi Flegrei and Vesuvius areas were geochemically and isotopically similar. After both Campanian Ignimbrite (39 ka) and Neapolitan Yellow Tuff (15 ka) caldera-forming eruptions, the isotopic compositions of the Campi Flegrei magmas varied and were characterised by more radiogenic Sr, less radiogenic Nd and Pb, and less negative δ^{11} B with respect to the older magmas. A similar variation, although less regular, is shown also by the Vesuvian magmas.

The Campi Flegrei magmatic system includes deep and shallow reservoirs. In the deep reservoirs (top is located at ca.10km of depth) magmas stagnate, differentiate and are probably contaminated by crust, and, trough time, either upraise forming shallow reservoirs, mostly located at <2km of depth, or upraise along regional faults bordering the caldera, feeding the eruptions. The petrological data evidence that in the shallow reservoirs mixing/mingling among distinct components (magma batches rising from the deep reservoir and residues of the Campanian Ignimbrite and Neapolitan Yellow Tuff magmas) and differentiated and have mostly incorporated xenocrysts remnants of earlier magmas. These processes have generated high heterogeneity and isotopic disequilibria in the erupted magmas.