

Pre-eruptive CO₂ budget of lower Cenozoic Neo-Tethyan magmas

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Plate tectonics and magmatism are linked to the evolution of climate and life as volcanoes are sources of surface carbon by releasing volcanic gases (by volcanic outgassing; CO₂, H₂O, halogens) from their vent before, during or after eruptions [1,2]. Establishing the pre-eruptive volatile content of volcanic arcs can shed light on possible magmatic effects on climate, thereby unravelling the interconnections between surface and deep Earth processes. Lower Cenozoic climate warming and cooling trends, in particular, can be correlated with changes in the Neo-Tethyan magmatic activity [1]. Magmatic melts trapped in crystals as melt inclusions can record the storage conditions of the magmas and the volatile content [3-5]. Based on the petrological records of fluids and volatiles within samples from Ladakh, India, we aim to retrieve their pre-eruptive CO₂ budget as a first step to reconstructing the time history of CO₂ emissions from the Neo-Tethyan margin and possible effects on the lower Cenozoic climate. Unravelling the relationships between climate and plate tectonics and magmatism will help us evaluate human activity's effects on the Earth system and predict current and future climate changes.

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