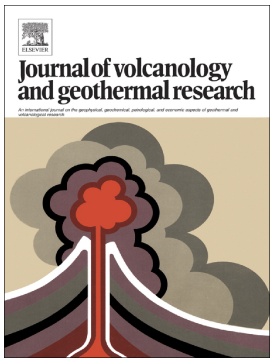

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SHALLOW CONTROLLING FACTORS ON THE EXPLOSIVITY OF BASALTIC MAGMAS: THE MAY 17-25 ERUPTION OF ETNA VOLCANO (ITALY)

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Abstract

Here, we present a detailed analysis of a small scale eruption at the type basaltic volcano Mount Etna, Italy, spanning 9 days in May 2016 from both a physical and geochemical perspective. A complexity rarely seen within the short timeframe was present with the style of activity manifesting as outgassing, strombolian explosions to weak fountaining, and lava flows while the eruption migrated between most of the summit craters. Through microprobe analysis of phenocrysts, groundmass glasses and melt inclusions we define geochemical trends by differentiating the eruptive products into two groups – the explosive tephra produced by lava fountaining, and lava and scoria emitted during Strombolian explosions. We highlight plagioclase and olivine compositions and variations in K_2O wt.% of glasses as evidence of the eruption of multiple magma bodies.The eruptive sequence was triggered and fed by a batch of magma reaching the surface after limited degassing and crystallisation. Despite its very small mass (about 0.01 % of the total erupted magma), it generated three lava fountains occurring within a four day timespan, producing ash-rich plumes which