

Report for the Joint Use/Research of the Institute for Planetary Materials, Okayama University for FY2023

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Category: International Joint Research General Joint Research Joint Use of Facility
Workshop

Name of the research project: *Tridymite formation as a direct consequence of explosive volcanism
- evidence preserved in tuffisite veins and concurrently erupted volcanic ash.*

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Research report:

The mineralogy of volcanic rocks is usually considered as a consecutive crystallization path related to a liquid line of descent. Tephra and pyroclastic rocks hold a special status as their formation includes the physical disruption of the magma during an explosive eruption. We describe tuffisite samples (captured veins of pyroclastic material in coherent lava bombs) and concurrently ejected volcanic ash from the ongoing eruption of Ebeko volcano. Our samples show that the formation of tridymite (a mineral, not present in the original phase assemblage of the magma) forms as a consequence of explosive eruptive activity, volatile exsolution and fluid flow following decompression and magma fragmentation. Tridymite phase identification was done at the IPM, Misasa using the using a Thermo Fisher Scientific DXR Raman microscope at Pheasant Memorial Laboratory, Institute for Planetary Materials, The occurrence of tridymite in volcanic ash is problematic as tridymite can cause long-term respiratory problems (i.e. tridymite is prevalent in the eruptive product that most easily enters the human lung).