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Crystal accumulation in, partial melting of and melt percolation through the Icelandic crust: constraints from glass-bearing gabbro xenoliths from Iceland

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Primitive magmas adequately reflect the composition of their sources only if they remain preserved from later processes of crustal contamination or interaction with surrounding wall rocks. However, such interactions appear very common when magmas pass through solid lithospheric rocks or crustal mush residing in the shallower depth magma reservoirs. Correct understanding these processes is viable for further geochemical and petrological interpretations. A diverse range of crustal xenoliths is hosted in young basaltic lavas and scoria deposits on Iceland. We report the first results of EPMA (major elements) and SIMS (trace elements) study of leicocratic and gabbroic xenoliths from the Grindavik and Graenavatn Lake localities, both located on Reykjanes Peninsula; Midfell and Maelifell eruption units, Thingvallavatn Lake; Tindfjallajökull Pleistocene volcanic complex; Kistufell table mountain located at the NW margin of the Vatnajökull ice cap. Gabbroic xenoliths from Kistufell represent an example of different stages of phenocryst accumulation in the magma chamber followed by crystal contraction, while leicocratic and gabbroic xenoliths from Tindfjallajökull exhibit clear signatures of *in-situ* partial melting and melt percolation. Most of the xenoliths contain chilled glass whose chemical compositions along with compositions and texture of coexisting mineral phases allow to estimate P-T and redox conditions of magma crystallization and storage, as well as the dynamics of chemical modifications occurred in the ascending magmas due to melt interaction with surrounding wall rocks. The results of the present study may have important implications

for understanding the processes of magma underplating worldwide.