UNIVERSITY OF ICELAND

Origin of gabbro and anorthosite mineral clusters in Fagradalsfjall lavas

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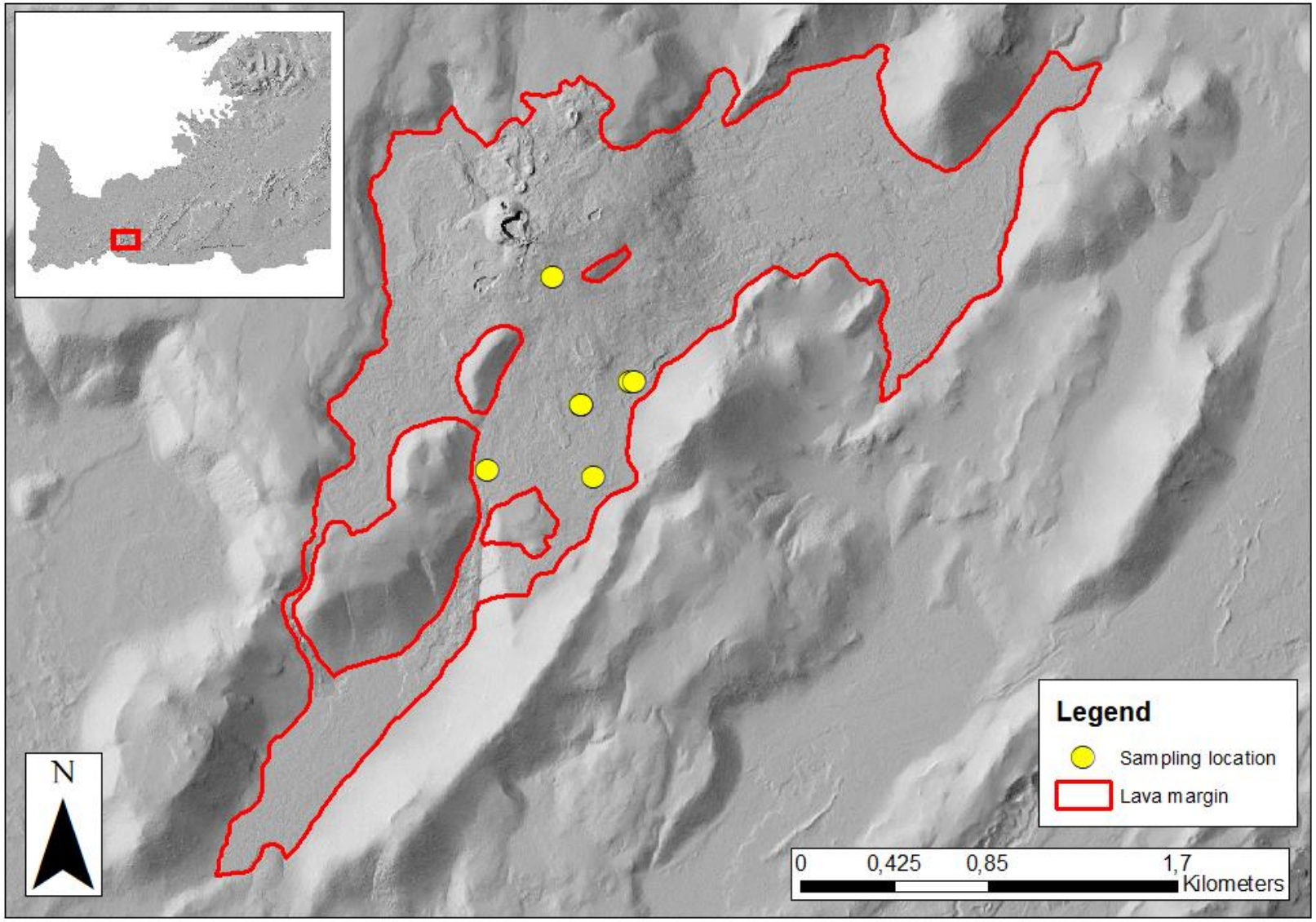
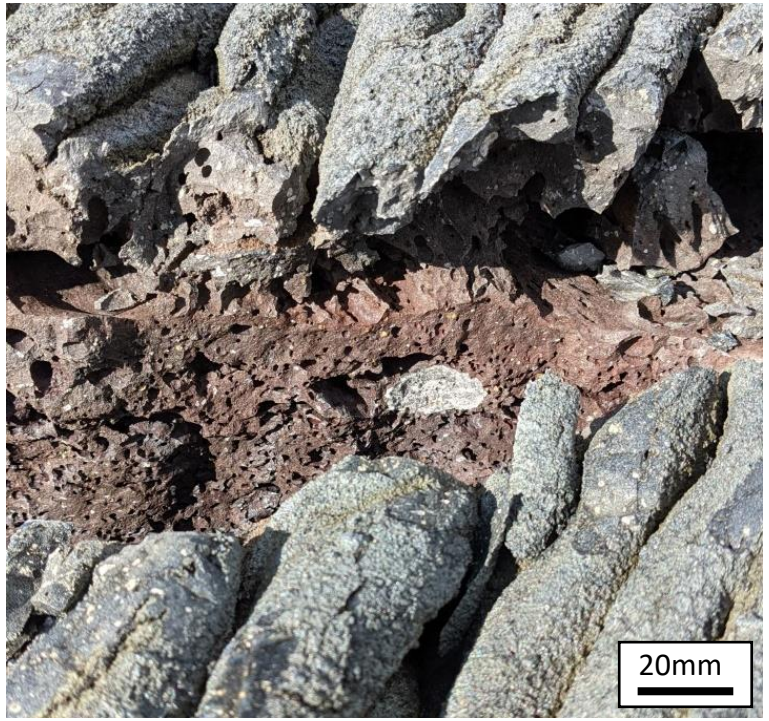
Sample locations

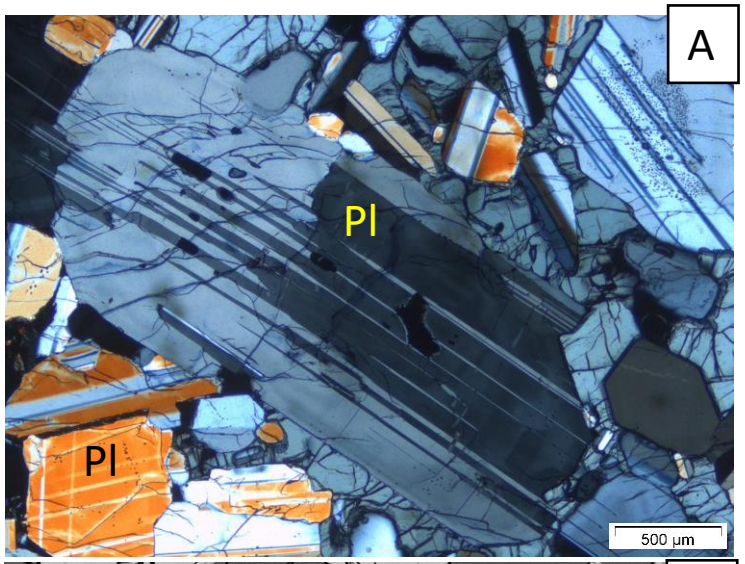


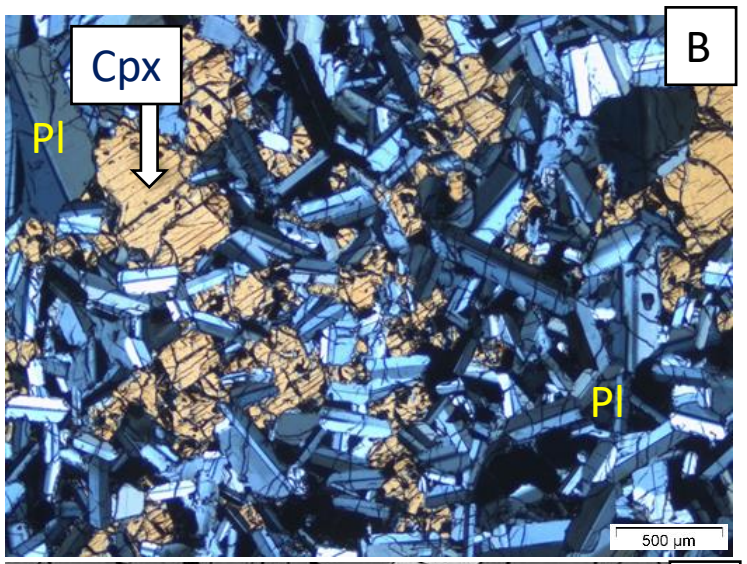


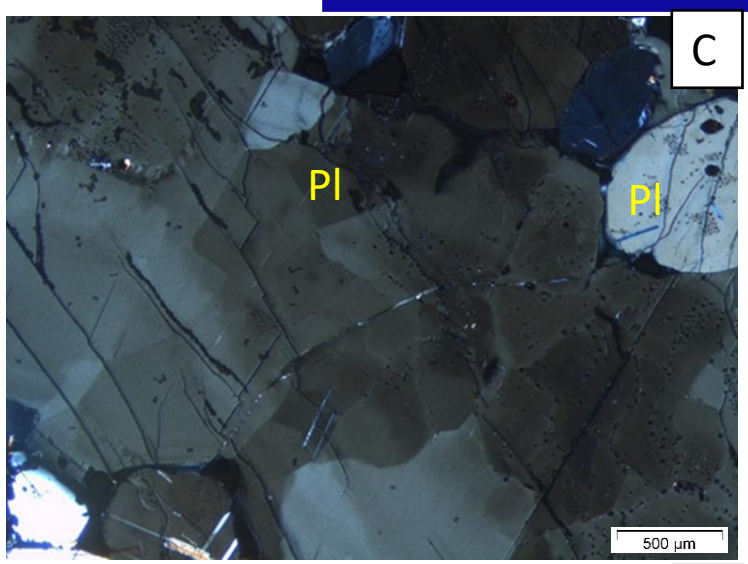
Exposed xenolith in host pahoehoe

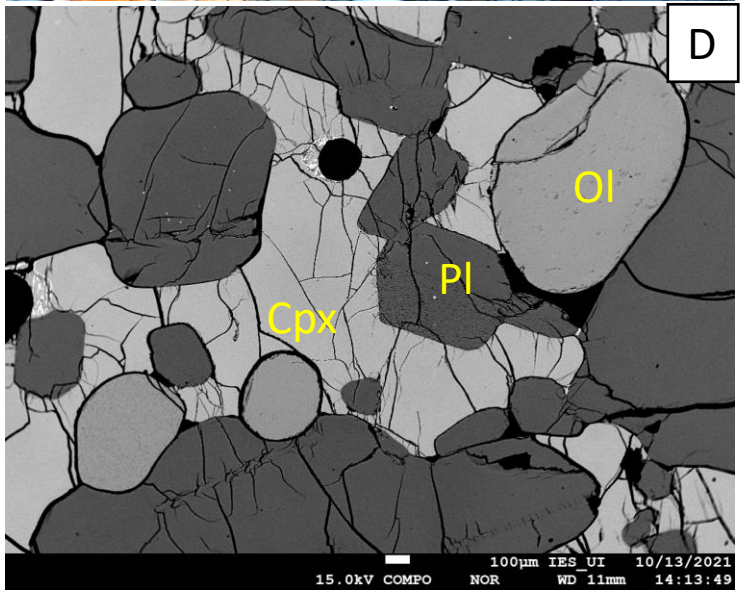
National Land Survey of Iceland (2021), Island DEM Version 1.0 2x2m ISN2016, retrieved from atlas.lmi.is/mapview/?application=DE

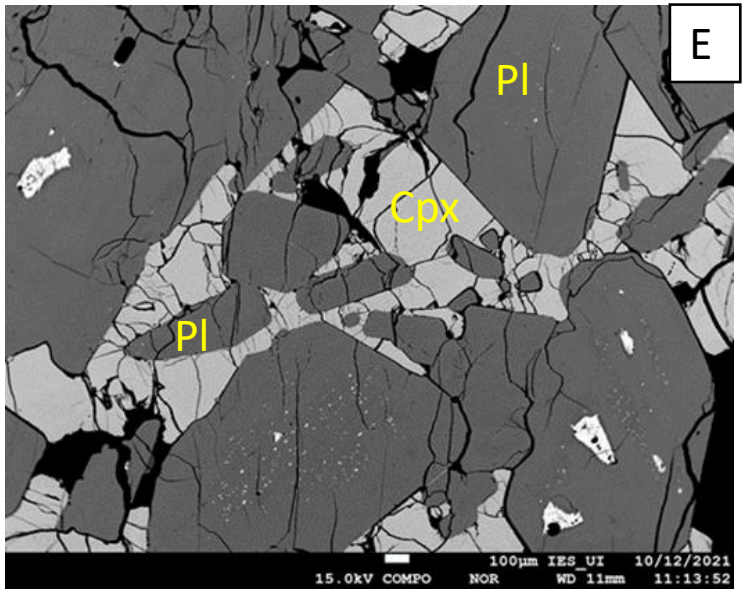
Petrography

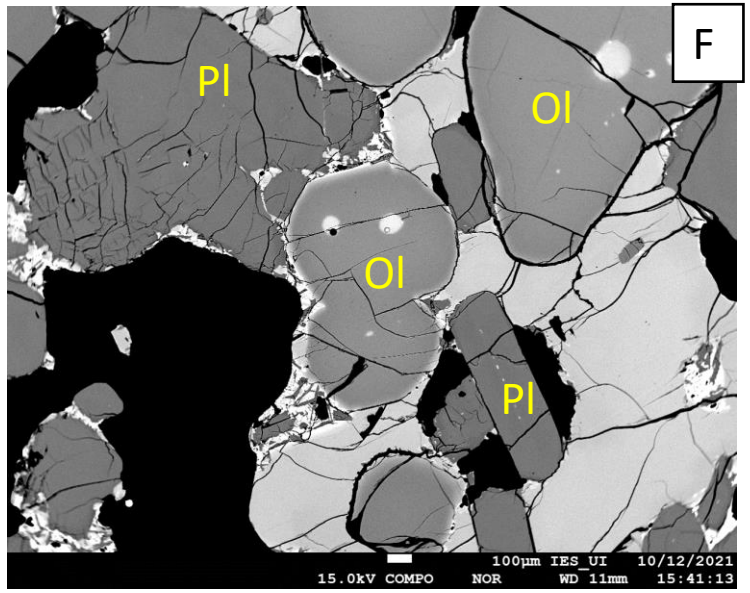




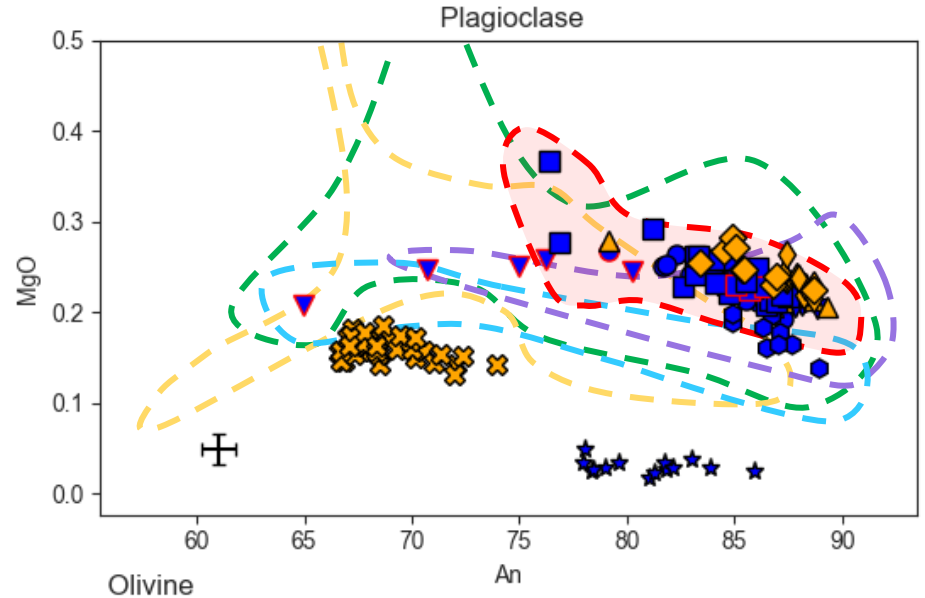


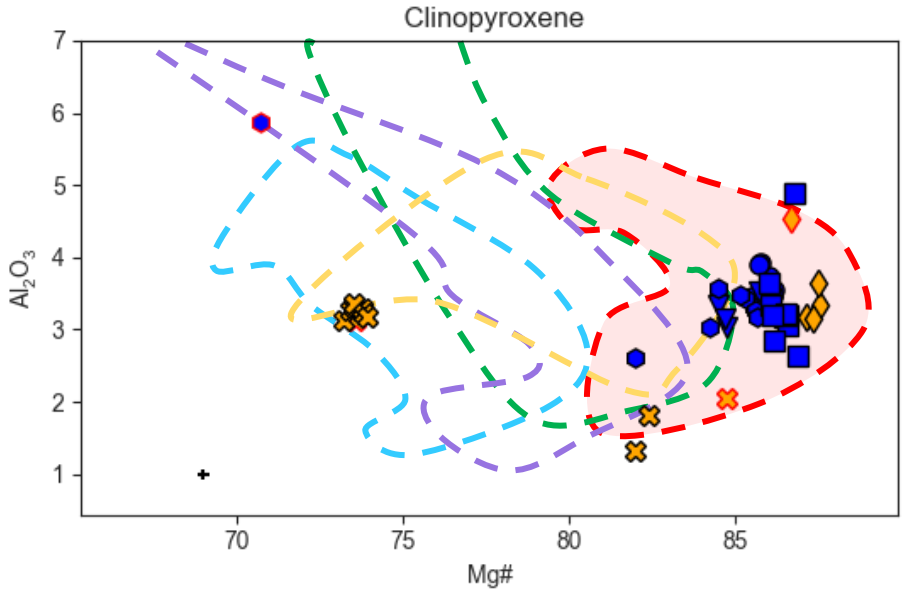


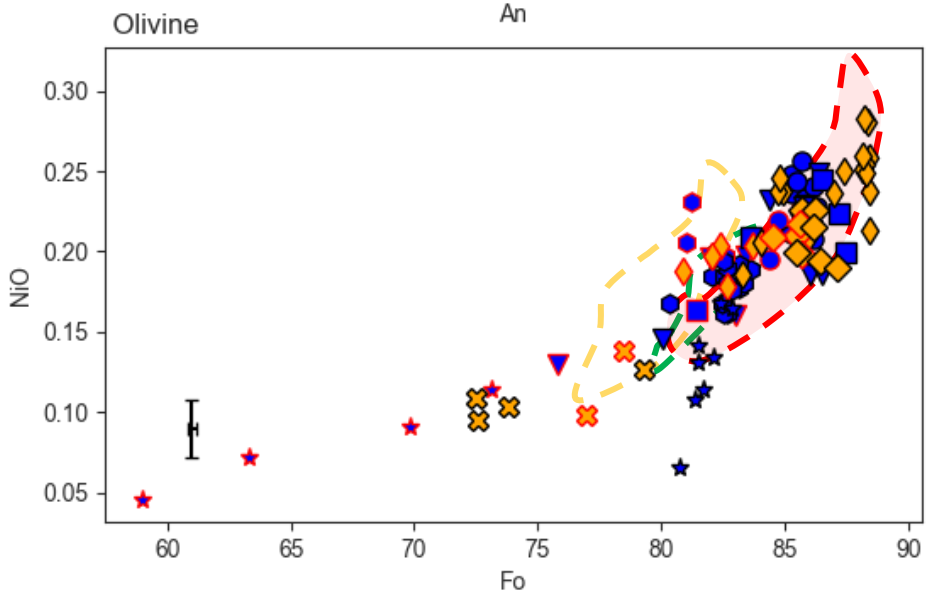


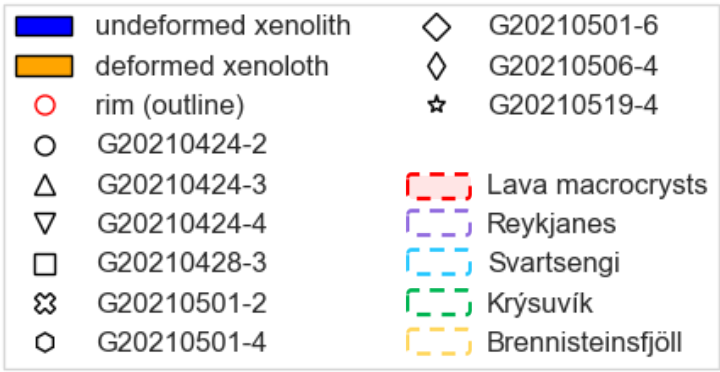


Chemistry







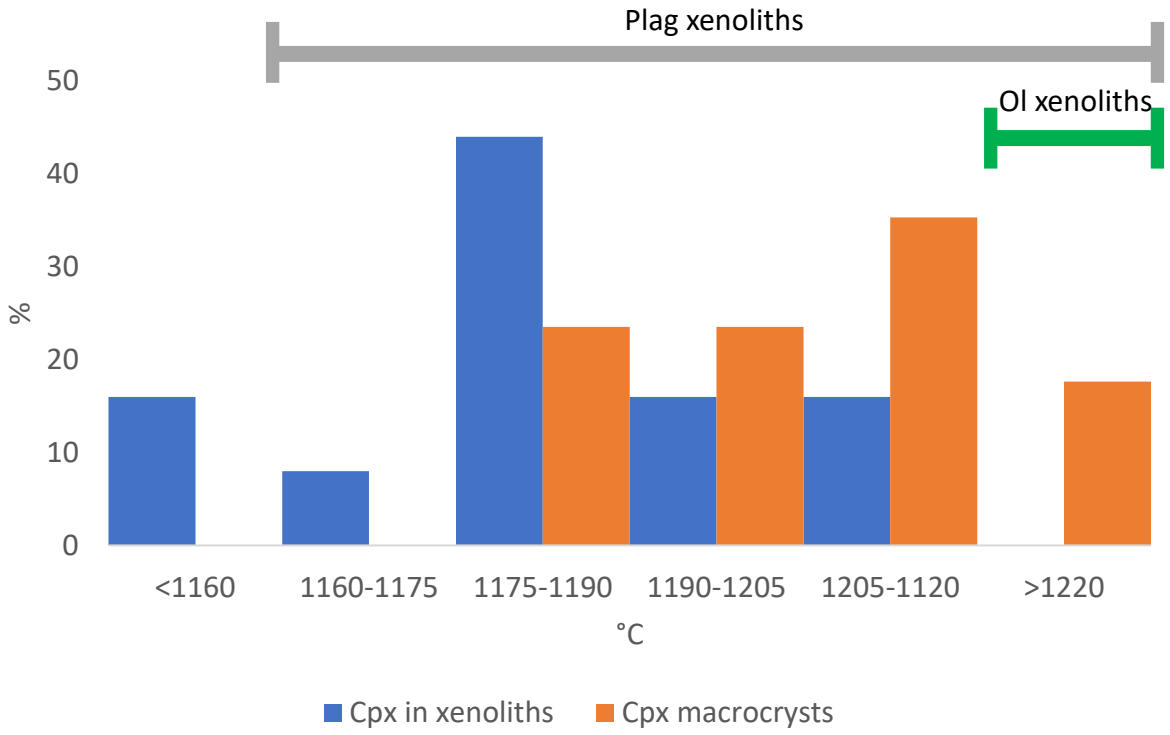


Reykjanes dataset -
Caracciolo et al in prep.

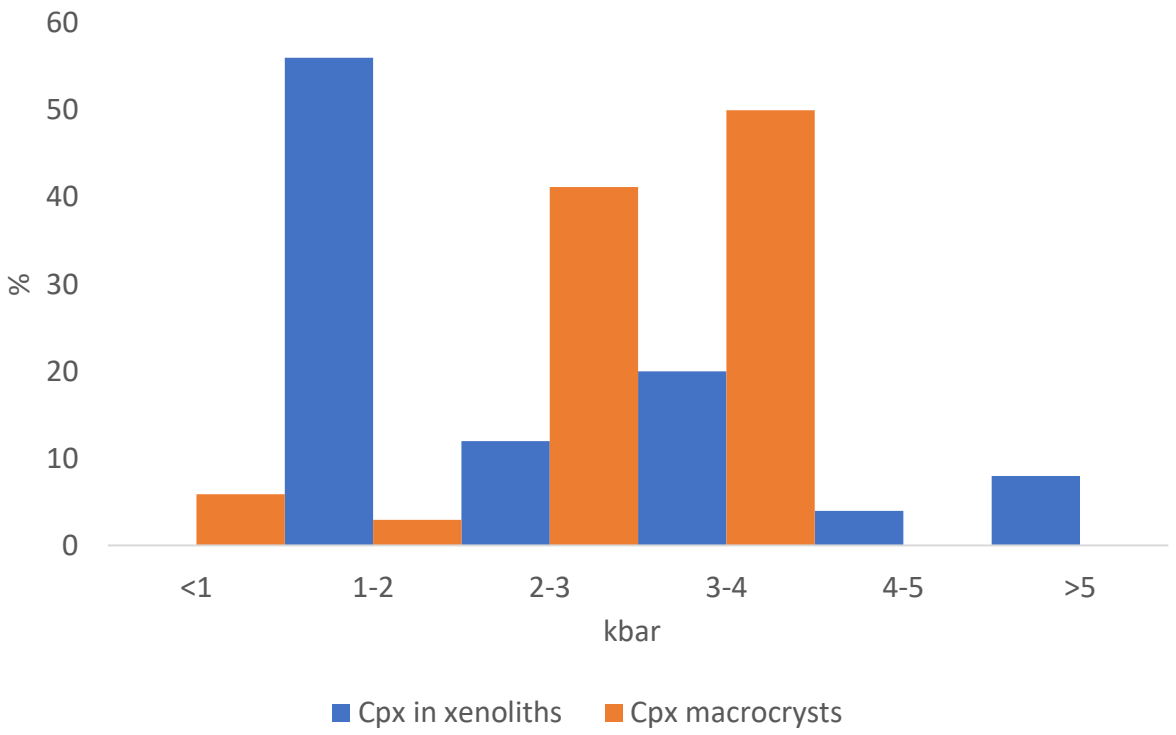
Fagradalsfjall compositions -
Halldórsson et al.
Nature, accepted for publication

Thermobarometry

Temperature



Pressure



Danyushevsky, L. V., & Plechov, P. (2011). Petrolog3: Integrated software for modeling crystallization processes. Geochemistry, Geophysics, Geosystems, 12(7). doi:https://doi.org/10.1029/2011GC003516

Neave, D., & Putirka, K. (2017). A new clinopyroxene-liquid barometer, and implications for magma storage pressures under Icelandic rift zones. American Mineralogist, 102, 777-794. doi:10.2138/am-2017-5968

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Conclusions

- Igneous and deformed textures were observed
- In some xenoliths clinopyroxene forms at the expense of olivine and plagioclase
- There is an overlap between the chemical composition of xenolith minerals and Fagradalsfjall macrocrysts, but the overlap is not perfect
- Xenoliths record similar T and P range as macrocrysts, however many macrocrysts record higher pressure than the xenoliths
- Some of the macrocrysts observed in the Fagradallsfjall lava are therefore likely disaggregated crystal mush material