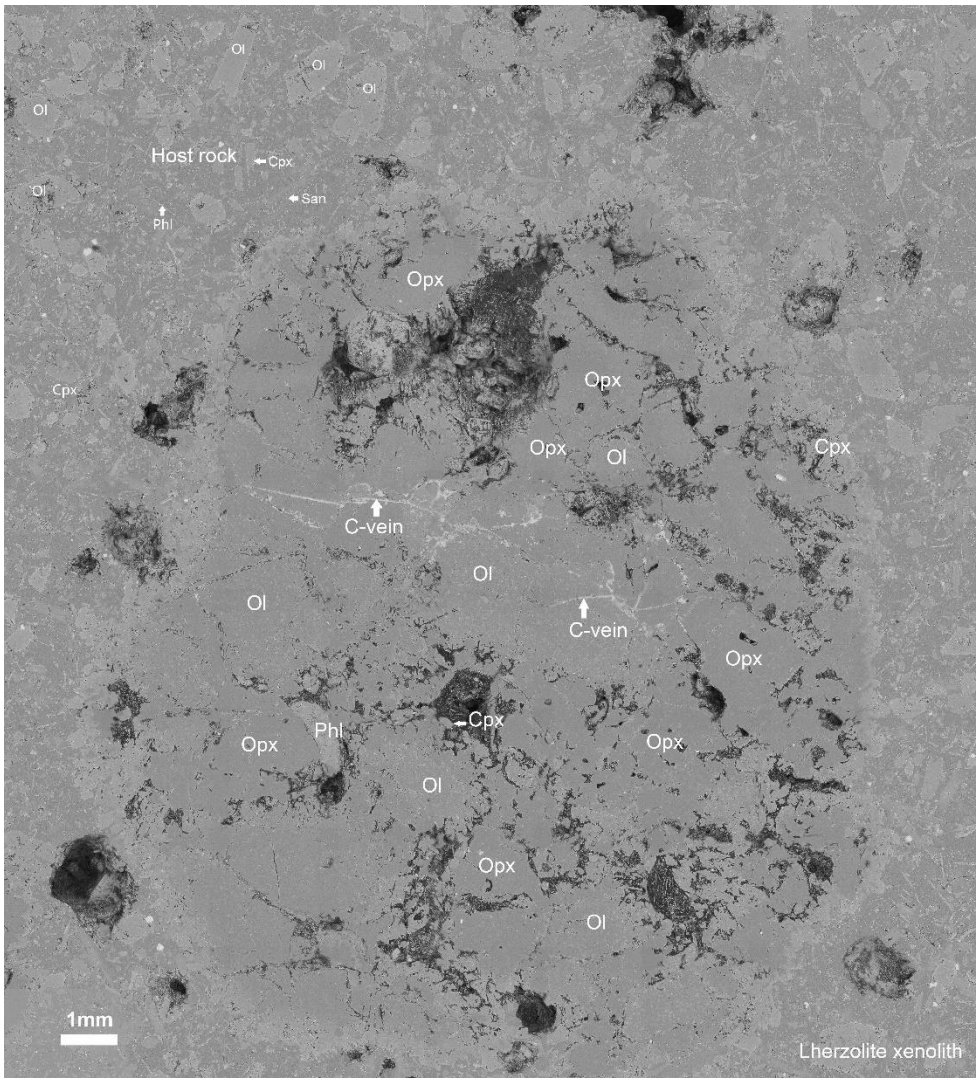
Carbonate- and silicate-metasomatized mantle beneath Himalayan-Tibetan orogenic belt

Weikai Li[1,2,3], Zhiming Yang[1]*, Zoltán Zajacz[3], Limin Zhou[4], and Zengqian Hou[1]

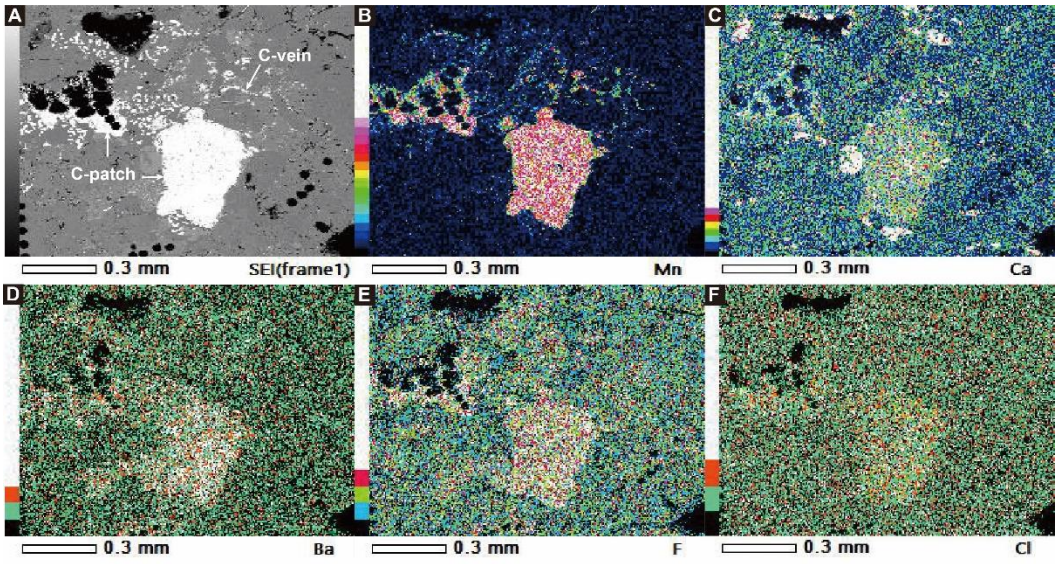
[1] *Institute of Geology, Chinese Academy of Geological Sciences (CAGS), Beijing 100037, China*
[2] *Department of Earth and Space Sciences, Southern University of Science and Technology, Shenzhen 518055, China*
[3] *Department of Earth Sciences, University of Geneva, Geneva 1205, Switzerland*
[4] *National Research Center for Geoanalysis, CAGS, Beijing 100037, China*
*E-mail: zm.yang@hotmail.com

This supplementary information includes Supplementary Fig. S1-S6 and Supplementary Table S1-S3 (tables were uploaded as separated files):

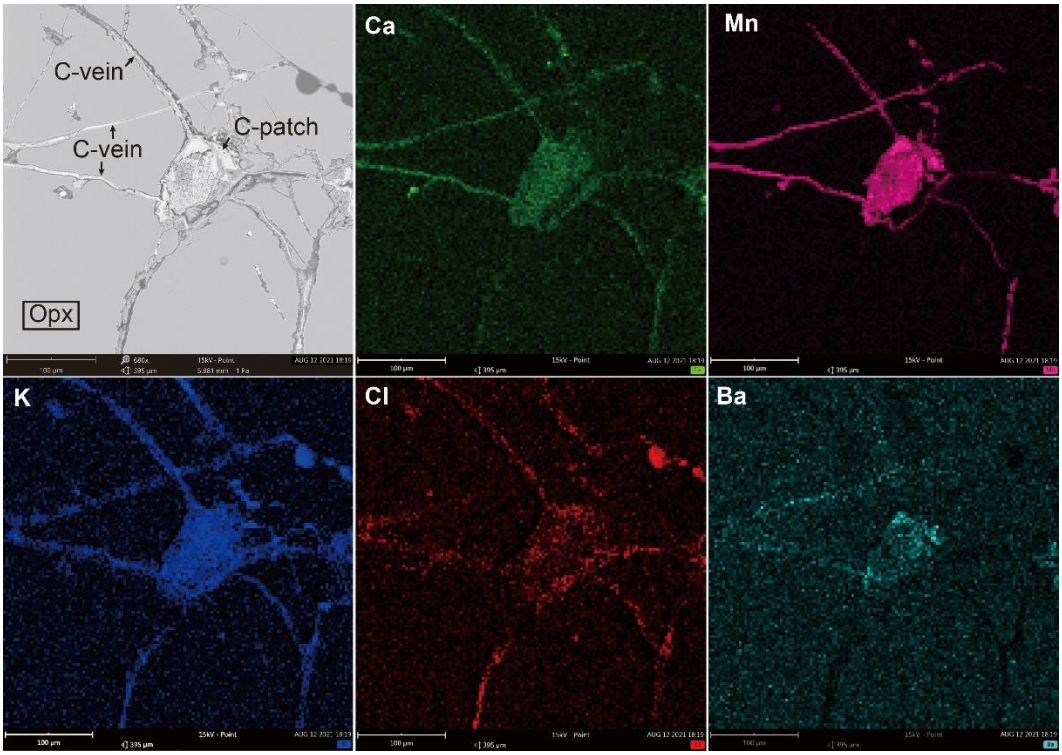


Supplementary Fig. S1. Back-scattered-electron (BSE) image illustrating the petrographic characteristics of a lherzolite xenolith (ORG) and ultrapotassic host rock. In BSE image,

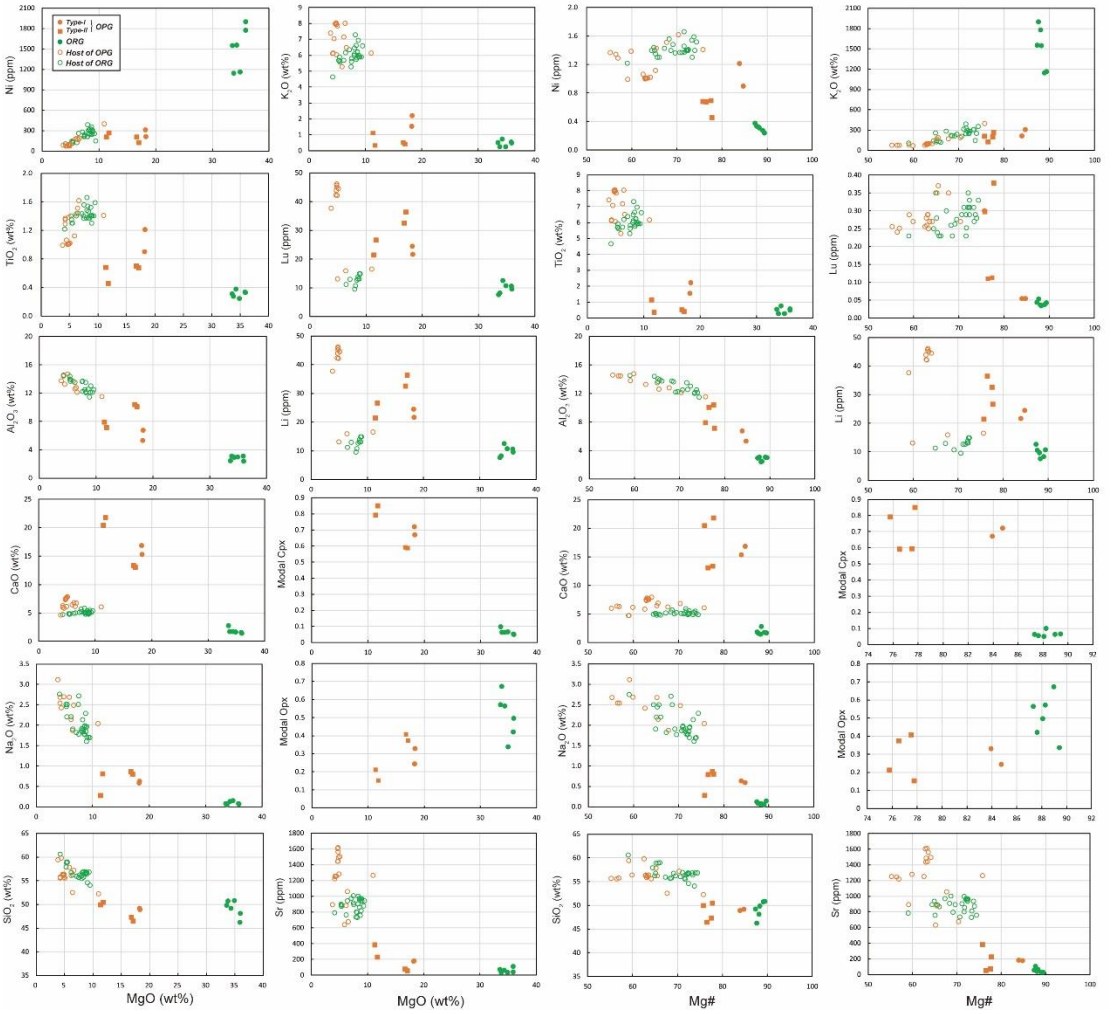
carbonate veinlets are present in the central part of ORG xenolith but they do not cut into host rock part. Carbonate vein is also not observed in host rock in this study. Minerals in lherzolite xenolith are mainly Ol, Opx, Cpx and Phl. Phenocrysts of trachyandesite host rock mainly consist of Ol, Cpx, San, Phl. Abbreviations: C-carbonate, Cpx-clinopyroxene, Ol-olivine, Opx-orthopyroxene, Phl-phlogopite, San-sanidine.



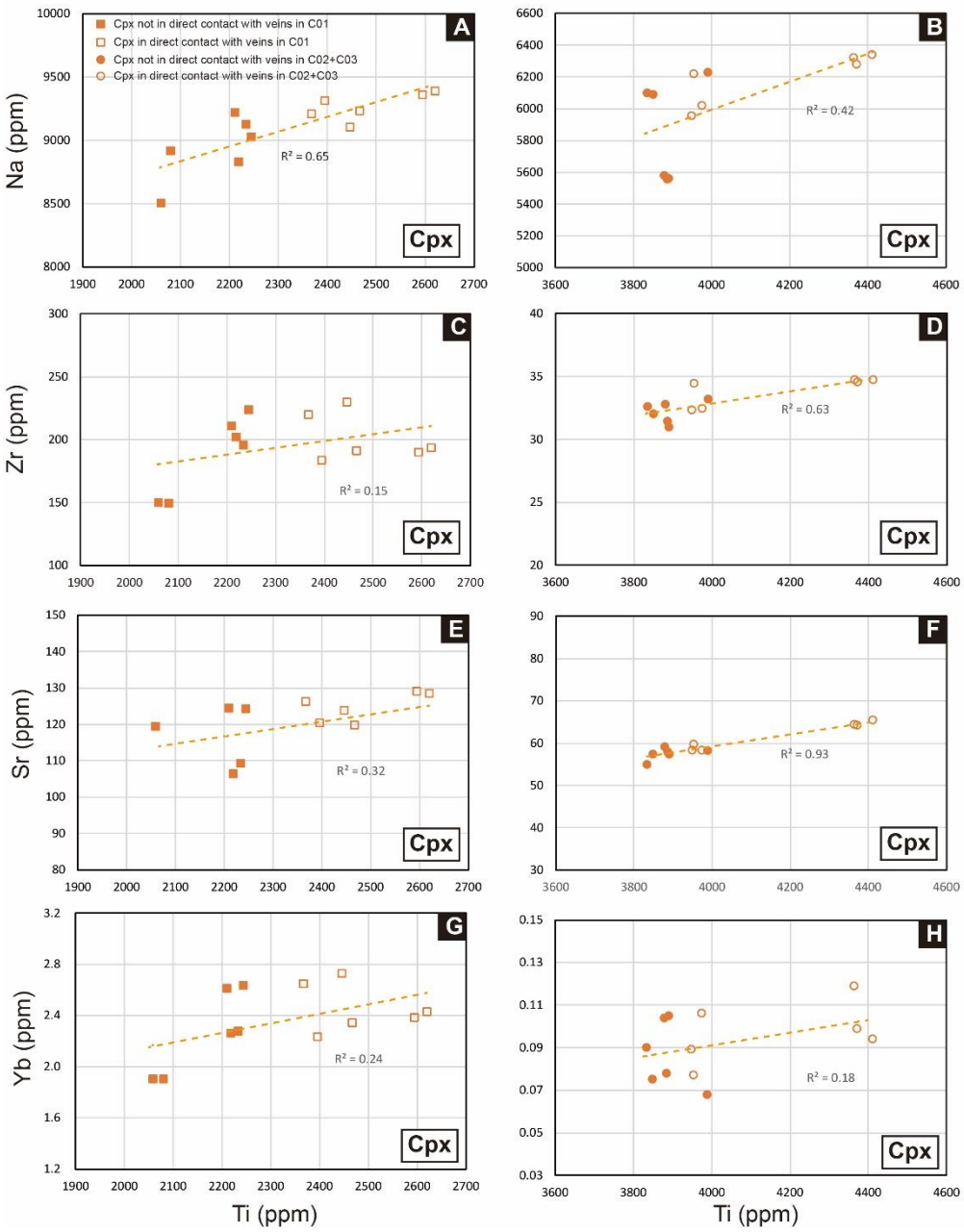
Supplementary Fig. S2. Energy Disperse Spectroscopy (EDS) images showing enriched elements (Mn, Ca, Ba, F, Cl) in carbonate patch and vein from ORG xenolith (lherzolite). Ba, F, Cl are fluid-mobile elements, their enrichment indicates fluid-rich carbonate metasomatism.



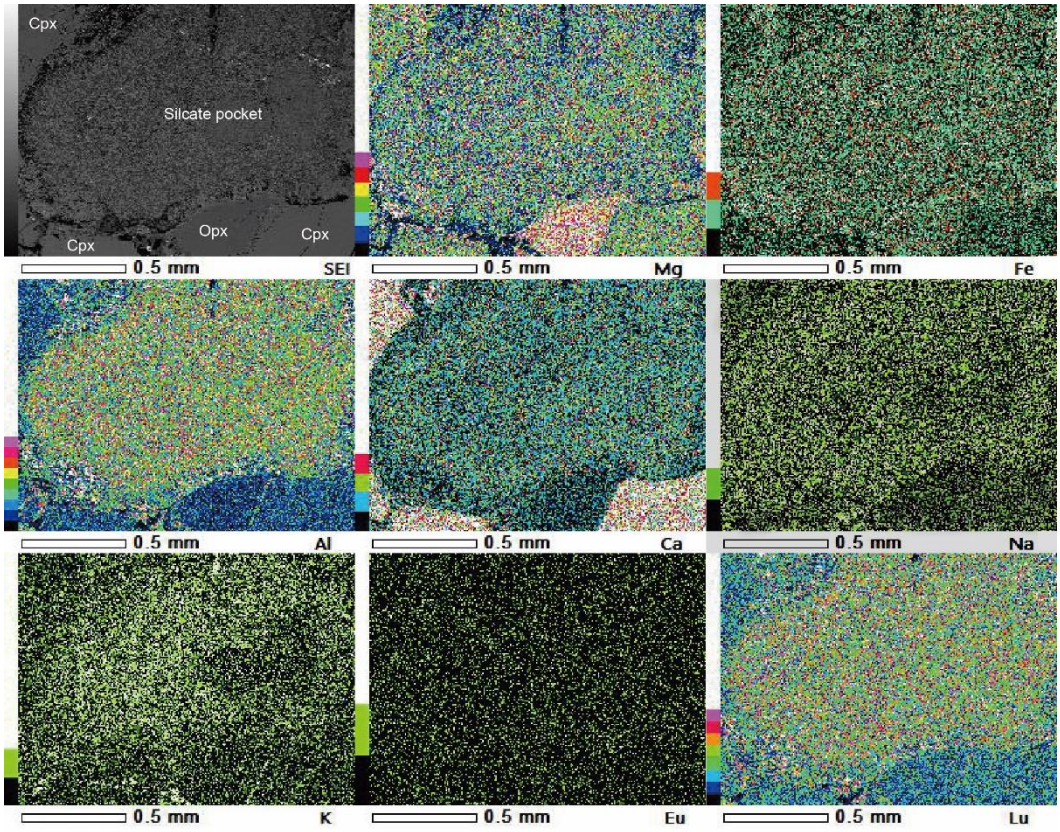
Supplementary Fig. S3. The EDS images showing enriched elements (Ca, Mn, K, Cl, Ba) in carbonate patch and vein from OPG xenolith (type I websterite). Enrichment of fluid-mobile elements (Ba, F, Cl) in carbonates suggests fluid-rich carbonate metasomatism



Supplementary Fig. S4. Whole-rock data plots of major, trace element and modal pyroxene. Oxides and modal Cpx contents seem to be elevated with decreasing of MgO and Mg# from ORG to OPG, but this trend is discontinuous between two groups. Data source is Table S1.



Supplementary Fig. S5. **Plots of trace elements of clinopyroxene.** Clinopyroxene in direct contact with silicate vein or pocket has higher Na, Zr, Sr, HREE than those not in contact.



Supplementary Fig. S6. The EDS images showing enriched elements (Mg, Fe, Al, Ca, Na, K, Eu, Lu) in silicate-bearing pocket from OPG xenolith (type II websterite).

Supplementary Table S1. Whole-rock major and trace element, and Sr–Nd isotope data of mantle xenoliths and ultrapotassic host rocks. Data published in literature are also collected from ref. 1-6.

Supplementary Table S2. In-situ trace element data of olivine analyzed by LA-ICP-MS.

Supplementary Table S3. Major, trace element and Sr isotope data of clinopyroxene.

References

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