

The work reviews the hydrogen solubility in SiO<sub>2</sub> stishovite and the implication behind it. I like to read it and I think the authors took in consideration all the relevant literature to write down such review. I also liked that they also proposed a new possible equation for calculating the solubility of hydrogen in stishovite. The work is written very well and the science is sound. So I recommend to publish it with only very minor corrections, which are reported here below.

Line 34-36. Well, here I would definitively cite Gu et al. (2022) Nature Geoscience, who showed that coesite (former stishovite) was present within a natural super-deep diamond formed at the boundary between the transition zone and the lower mantle.

Thank you very much for your suggestion. We cited Gu et al. (2022) in the revised text.

Line 51. Please use the accepted nomenclature for space groups (so the Bravais lattice, and the glide and mirror planes must be reported in Italic)

Thank you for pointing out this problem in manuscript. We corrected it.

Line 215. “Gavrilenko (2008)” instead of “Gavrilenko, 2008 showed..”

Thank you so much for your careful check. We corrected it.

I have doubled checked the references and I only found the following minor issues:

- Bolfan-Casanova et al., 2000 (in Table 1) is mentioned in the text but is missing in the reference list

Thank you very much. We added Bolfan-Casanova et al. (2000) into the references list.

- Stishov and Popova (1961) is not quoted in the reference list

We are very sorry for our negligence. We added it.

- Yin and Kang, 2023 check with the journal if this can be reported

Thank you very much. we replaced this citation with Lu and Keppler (1997) who contributed a thermodynamic model for water solubility in garnet.

#### **Paper mentioned:**

Bolfan-Casanova, N., Keppler, H., and Rubie, D. C.: Water partitioning between nominally anhydrous minerals in the MgO–SiO<sub>2</sub>–H<sub>2</sub>O system up to 24 GPa: implications for the distribution of water in the Earth’s mantle, *Earth and Planetary Science Letters*, 182, 209–221, [https://doi.org/10.1016/S0012-821X\(00\)00244-2](https://doi.org/10.1016/S0012-821X(00)00244-2), 2000.

Gu, T., Pamato, M. G., Novella, D., Alvaro, M., Fournelle, J., Brenker, F. E., Wang, W., and Nestola, F.: Hydrous peridotitic fragments of Earth’s mantle 660 km discontinuity sampled by a diamond, *Nat. Geosci.*, 15, 950–954, <https://doi.org/10.1038/s41561-022-01024-y>, 2022.

Lu, R. and Keppler, H.: Water solubility in pyrope to 100 kbar, *Contributions to Mineralogy and Petrology*, 129, 35–42, <https://doi.org/10.1007/s004100050321>, 1997.

Stishov, S. M. and Popova, S. V.: A new dense modification of silica, *Geokhimiya*, 10, 923–926, 1961.