Variation of the unit cell dimensions in relation to the sizes of coordination polyhedra in olivine structure

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A qualitative understanding of variation of the unit cell dimensions in relation to the sizes of coordination polyhedra in olivine structure are given from the inspection of the thicknesses of MO6 octahedra along the crystallographic axes with the view point of the constrains by the symmetry operations of space group Pbnm. Variation of the unit cell dimensions with pressure, temperature and composition [1] is interpreted in terms of retractable and unretractable chains in the part of olivine structure.

References

[1] Kudoh, Y. (2008) Crystal structural features of hydrous forsterite: Effect of Fe on the M-site vacancies, possible hydrogen positions and variation of the unit cell dimensions. Journal of Mineralogical and Petrological Sciences, 103, 371-375 (http://www.jstage.jst.go.jp/article/jmps/103/5/371/_pdf)