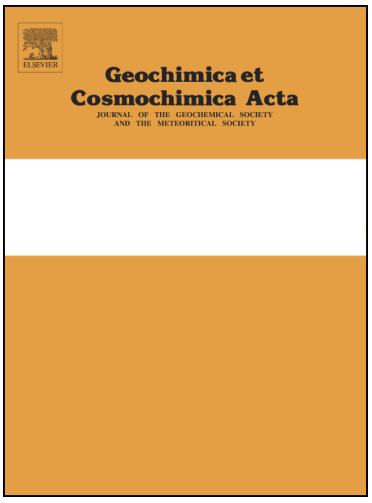

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Substitution and diffusion of Cr^{2+} and Cr^{3+} in synthetic forsterite and natural olivine at 1200-1500 °C and 1 bar

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Keywords: experimental petrology, diffusion, XANES spectroscopy, chemical activity, olivine

[[**note to typesetters**: $a\mathrm{SiO_2}$ and $f\mathrm{O_2}$, used throughout, are sub sub, i.e. $a_{\mathrm{SiO_2}}$ and $f_{\mathrm{O_2}}$]]

Abstract

The diffusion and substitution mechanisms and Cr in forsterite were studied as a function of crystallographic orientation and the chemical potentials of all four components in the system $MgO\text{-}SiO_2\text{-}Cr\text{-}O$. Oxygen fugacity ($fO_2$) was varied over 15.4 log units at 1400 °C and was fixed at iron-wüstite equilibrium for a temperature