

## Polarized Infrared OH Spectra of mantle xenolith olivine

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The single crystals used for this study were occurred from Mirl mine, Russia. Chemical composition of the samples measured by EPMA was  $Mg_{1.86}Fe_{0.13}Ni_{0.01}SiO_4$ . Single crystal samples were prepared as their sections parallel to (100), (010) and (001) by the use of X-ray precession camera.

The IR spectra of the samples measured by Fourier Transform Infrared spectrometer (FTIR) with polarized light showed the eight sharp peaks due to OH stretching mode at 3300, 3368, 3458, 3480, 3495, 3572, 3596, and 3613  $cm^{-1}$ . All bands shows maximum absorption when the E vector was parallel to [100]. Only the absorption band at 3572  $cm^{-1}$  in (010) are observed both the absorption parallel to [100] and [001].

The present results of the polarized IR observation, suggest vacancies in the T site, an OH direction along the line O1-[Si]. Based on the result consideration for relation of OH stretching frequency versus O-H...O bond distance (Nakamoto et al., 1955) and OH absorption relation, the absorption band at 3572  $cm^{-1}$  suggests two vacancies model in the M site. These results agree well with the model reported by Linowitzky and Beran (1995).