

Determination of molar absorptivities for the IR microspectroscopy of water contents in rhyolitic volcanic glasses

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We determined the molar absorptivities for both OH and H₂O in rhyolitic volcanic glasses in infrared microspectroscopy. Some natural obsidians were used for standard samples and their total water contents were measured by Karl Fischer titration and thermogravimetry. The absorbance at 3550cm⁻¹(X-OH) and 1630cm⁻¹(H₂O) in micro-FTIR spectra were plotted against the sample thickness. Assuming that the sum of water contents calculated from absorbance at 3550cm⁻¹ and 1630cm⁻¹ was the total water contents, the molar absorptivities for these bands can be determined by the least-squares method. The resulted molar absorptivities can be applied to determine water contents for hydrous rhyolitic glasses under IR microscope.