

Hydroxide in kyanite: A quantitative determination of the absolute amount and calibration of the IR spectrum

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ABSTRACT

The hydrogen contents of four natural kyanite samples were determined by ¹⁵N nuclear reaction analysis and used to calibrate an IR spectroscopic method for a more convenient quantitative H analysis of kyanite. Hydrogen is present as the OH⁻ ion and (expressed as ppm H₂O by weight) ranges from near zero up to 230 ppm. Its content is best determined from integrated absorbance of the OH bands in the 3200–3450 cm⁻¹ range. Approximate concentrations can be determined from measurements of either summed peak heights or integrated areas of spectra obtained from just the two principal optical directions in the cleavage plane. The present calibration leads to estimates of the OH concentration in kyanite that are about a factor of 18 lower than the earlier calibration of Beran and Götzinger (1987).