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# In situ observation of the decomposition of kyanite at high pressures and high temperatures

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## ABSTRACT

In situ observations of the decomposition of kyanite, $Al_2SiO_5$, were carried out in a multi-anvil high-pressure apparatus using synchrotron radiation, where the phase change from kyanite to stishovite + corundum was observed at high pressures and high temperatures. The phase boundary of this decomposition at $T = 1200$–$1900$ K and $P = 5$–$15$ GPa was determined to be, $P$ (GPa) = 10.2 + 0.0016 × $T$ (K). Previous studies using the quench method showed a discrepancy in the transition pressure of the decomposition. Our results using in-situ observations resolve this dispute.

**Keywords:** Phase transition, kyanite, high pressure, X-ray diffraction