
Micro-Raman spectroscopy of the high low transition of quartz solid solutions crystallized from aluminosilicate glasses

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Abstract

The phase transition between a low-temperature trigonal form (space group $P3121$ or $P3221$) and a high-temperature hexagonal one (space group $P6422$ or $P6222$) of stuffed derivatives of quartz crystallized from glasses of the $\text{Li}_2\text{O-Al}_2\text{O}_3\text{-SiO}_2$ system was determined by micro-Raman spectroscopy. This method enables local (mm scale) assignment of the high-/low-type of quartz crystal and an indirect determination of their chemical composition (degree of stuffing) from the position and intensity of characteristic bands close to 110, 355 and 460 cm^{-1} . Raman spectra were presented in a wide range of compositions ranging from 100–50 mol% SiO_2 .

Keywords: Micro, Raman, quartz transition, glass ceramic, LAS

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