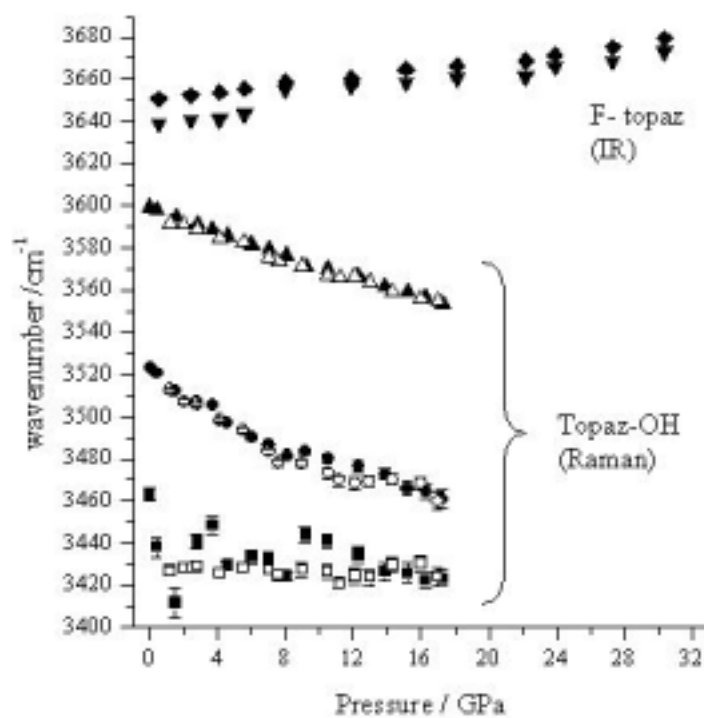


## Pressure dependence of OH stretching mode in F-rich natural topaz and topaz-OH

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OH stretching mode of F-rich natural topaz (F-topaz) and synthesized fully hydrated topaz (topaz-OH) were observed with vibrational spectroscopy at high pressures up to 30.4GPa and 17.3GPa, respectively. In F-topaz, pressure derivative of the frequency of the OH stretching band observed at 3650cm<sup>-1</sup> at ambient pressure is 0.91(3)cm<sup>-1</sup>/GPa. On the other hand, in topaz-OH, those of the bands initially at 3599cm<sup>-1</sup> and at 3522cm<sup>-1</sup> are -5.2(2)cm<sup>-1</sup>/GPa and -2.56(6)cm<sup>-1</sup>/GPa, respectively. This contrast in behavior at high pressures between the two forms of topaz suggests that topaz-OH is only stabilized under high pressure by forming stronger hydrogen bonds than at ambient pressure.



**Fig.1** Comparison of dependencies of OH-stretching modes on pressure of topaz-OH with ones of F-rich natural topaz. Filled symbols show results on compression, and open symbols show results on decompression.