

Pressure estimation for diamond anvil cell under very-low pressures, hydrostatic conditions - re-evaluation for quartz Raman peak shifts -

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Pressure shift of the ruby R1 luminescent has been used as primary pressure gauge in diamond-anvil experiments. However, the pressure calibration under low-pressure conditions (<1 GPa) was poorly constrained although crustal hydrothermal experiments are important. For calibration of the R1 luminescent shifts at low-pressure conditions, we have done diamond anvils experiments at room temperature conditions. H₂O and ethanol were used as pressure transmitting medium and all experimental pressures was below ice stability field keeping hydrostatic-pressure conditions. We could get well-constrained new calibration line. Our new pressure estimation based on the quartz Raman peaks gives lower pressures than that of previous experiments reported by Schmidt and Ziemann (2000). For example, it would give 0.6 GPa from our experimental study although the previous study estimated at 1 GPa. This discrepancy causes significant overestimates for residual pressures determined by quartz Raman analysis from the natural rocks.

Schmidt, C., and Ziemann, M.A., 2000, *American Mineralogist*, v. 85, p. 1725–1734.