

Relationship between tensile strength and hydroxyl concentration of quartz

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A new method to measure the tensile strength in quartz micro-samples has been developed. The relation between the tensile strength and the OH and H₂O content of the samples, at room temperature and atmospheric pressure, has been studied. Euhedral quartz crystals and quartz grains in granite were prepared and used for conducting the experiments. The concentrations of OH and H₂O in quartz were measured by means of micro-FTIR. The result of the fracturing showed that the tensile strength of quartz is least influenced by its contents of OH and H₂O. This suggests that OH and H₂O existing in the grain boundary possibly cause the decrease in rock strength.