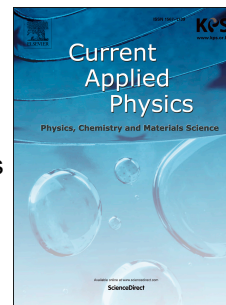


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High-pressure synchrotron X-ray diffraction study of tremolite and actinolite in various fluids

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1 **High-pressure synchrotron X-ray diffraction study of tremolite and actinolite in**
2 **various fluids**

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8
9 **ABSTRACT**

10 Pressure-dependent structural and morphological changes of two amphibole minerals,
11 tremolite and actinolite, were investigated up to 7.0 GPa using synchrotron X-ray
12 powder diffraction under three different pressure transmission media (PTM): water (W),
13 CO₂ and silicone oil (SI). The elastic response of tremolite and actinolite are found to
14 be dependent on the PTM used. When using water (W) as PTM, tremolite and
15 actinolite show normal volume contractions with bulk moduli of 74(1) and 78(1) GPa,
16 respectively. When using CO₂ as PTM, we observe the formation of calcite from
17 tremolite above 3.8(1) GPa, whereas actinolite did not show any carbonation reaction.
18 Under silicone oil PTM, we observe modulated volume contraction behaviors in both
19 samples, compared to water and CO₂ PTM, with bulk moduli in the order of 90(1) and
20 94(4) GPa for tremolite and actinolite, respectively.

21
22 **Keyword** : amphibole, x-ray scattering, high-pressure, pressure transmission media

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