



## Sub-critical crack growth rate of soda-lime-silicate glass and less brittle glass as a function of fictive temperature

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### Abstract

Sub-critical crack growth rates of soda-lime-silicate glass and less brittle glass with different fictive temperatures were compared using the DCDC method under both dry and humid atmospheres in order to investigate the origin of the unique mechanical features of the less brittle glass developed by Ito and his collaborators. In both dry and humid atmospheres, the crack velocity of the soda-lime-silicate glass was slower than that of the less brittle glass. For both glasses, the glass sample with higher fictive temperature showed a slower crack growth rate under both dry and humid atmospheres. These observations can be explained by the tendency for the plastic flow at the crack tip; the soda-lime-silicate glass is expected to show easier plastic flow under tension than the less brittle glass, and also the samples with higher fictive temperatures are expected to show easier plastic flow, leading to greater fracture toughness,  $K_{IC}$ , and slower crack growth rate.  
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