# Take Home Exam03F: Subcritical Crack Growth

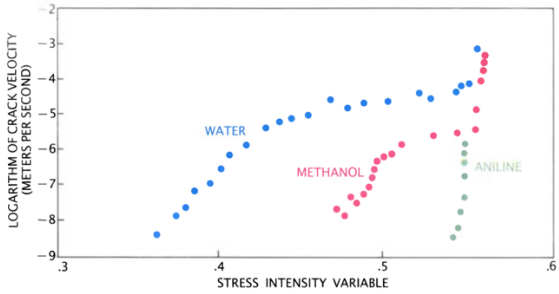
**Assigned: 04/05/2022 (Tuesday)**

**Due (as pdf by email) 04/08/2022 (Friday)**

(ii) Please send your submission via email starting with HWExam03F in the subject line.

## 03F.1

Equation (2) from today's notes predicts $K_{th}$ of about 0.5 MPa $m^{1/2}$, whereas the experimental value given in




is about 0.35 MPa $m^{1/2}$.

Give two possible reasons for this discrepancy.

## 03F.2

Compare the schematic for subcritical crack growth shown in today's class notes (with the three stages) to the data showing the influence of humidity on stress corrosion behavior. Explain in a few words,

(i) Why does the Stage II propagation rate increase with humidity.

(ii) Draw idealized schematics (as in today's notes), one for silica glass and the other for what you may expect for soda lime glass, on the same relative scale? Hint: soda lime glass contains sodium and its elastic modulus is lower than for silica.