

## CHEM-450

### Quiz # 4

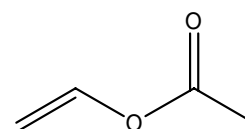
**Q1.** "Initiators" begin and may end a polymer chain. If for free radical polymerization in solution, the initial monomer concentration is increased by a factor of 100:

(a) How is the rate of polymerization affected quantitatively?

(b) What changes take place in the number average degree of polymerization?

**Q2.** The standard enthalpy and entropy of polymerization for vinyl acetate are -88 kJ/mol and -110 J/K-mol, respectively for a standard state of 1 mole/liter monomer concentration.

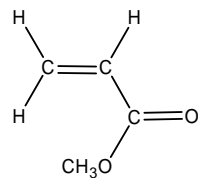
What is the value for the ceiling temperature given these conditions



vinyl acetate

- Q3.** For a free radical polymerization of vinyl acetate, it is found that the chain transfer constant for transfer to polymer is  $C_p = 4.5 \times 10^{-4}$ . Calculation of the number average degree of polymerization in the absence of transfer reactions is  $\overline{DP}_0 = 1500$ . What is the number average degree of polymerization in the presence of chain transfer? (can assume a constant and equal concentration of polymer relative to monomer).

- Q4.** Illustrate termination by means of disproportionation for polymerization of methyl acrylate.



Methyl acrylate