Assignment VII

- E22.7b The rate constant for the first-order decomposition of a compound A in the reaction $2A \rightarrow P$ is k=1.78x10^{-7} s^{-1} at 25ºC.
  What is the half-life of A?
  What will be the pressure initially 32.1kPa at (a) 10s (b) 10min after initiation of the reaction

- P23.3 The following radical chain mechanism proposed for the initial stages of gas-phase oxidation of silane by nitrous oxide

(1) $N_2O \rightarrow N_2 + O$

(2) $O + SiH_4 \rightarrow SiH_3 + OH$

(3) $OH + SiH_4 \rightarrow SiH_3 + H_2O$

(4) $SiH_3 + N_2O \rightarrow SiH_3O + N_2$

(5) $SiH_3O + SiH_4 \rightarrow SiH_3OH + SiH_3$

(6) $SiH_3 + SiH_3O \rightarrow (H_3Si)_2\,O$

(a) Label each step with its role in the chain

(b) Use steady state approximation to show that (provided k_1 and k_6 are small): $\frac{d[SiH_4]}{dt} = -k[N_2O][SiH_4]^{1/2}$