

<물리화학 Homework #6>

1. 아래의 빈칸(①~⑦)을 유도하시오.

Order	Reaction	Rate law*	$t_{1/2}$
0	$A \rightarrow P$	$v = k_r$ $k_r t = \text{①}$	②
1	$A \rightarrow P$	$v = k_r[A]$ $k_r t = \text{③}$	④
2	$A \rightarrow P$	$v = k_r[A]^2$ $k_r t = \text{⑤}$	⑥
	$A + B \rightarrow P$	$v = k_r[A][B]$ $k_r t = \text{⑦}$	

2. At 2257 K and 1.00 bar total pressure, water is 1.77 per cent dissociated at equilibrium by way of the reaction $2 \text{H}_2\text{O}(\text{g}) \rightleftharpoons 2 \text{H}_2(\text{g}) + \text{O}_2(\text{g})$. Calculate K.

3. In the gas-phase reaction $A + B \rightleftharpoons C + 2D$, it was found that, when 2.00 mol A, 1.00 mol B, and 3.00 mol D were mixed and allowed to come to equilibrium at 25°C, the resulting mixture contained 0.79 mol C at a total pressure of 1.00 bar. Calculate (a) the mole fractions of each species at equilibrium, (b) K_x , (c) K, and (d) $\Delta_r G^\ominus$.

4. A second-order reaction of the type $A + B \rightarrow P$ was carried out in a solution that was initially 0.075 mol dm⁻³ in A and 0.050 mol dm⁻³ in B. After 1.0 h the concentration of A had fallen to 0.020 mol dm⁻³. (a) Calculate the rate constant. (b) what is the half-life of the reactants?