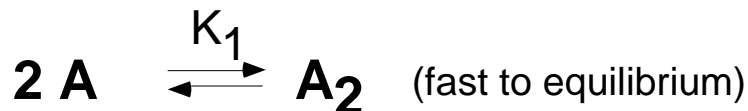
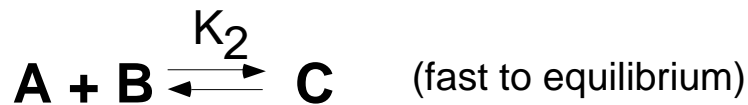


**Work independently. Do not look at others' exams.
Do not allow your exam responses to be shared.**

Consider the reaction mechanism shown at right, the reaction of hydrogen halide (A) with an olefin (B), to give product P.



Based on this mechanism, derive an expression for the initial velocity of the reaction as a function of the concentrations of only A and B, and the rate and equilibrium constants. Use the concentrations of A and B *after* the fast equilibria have been established.



$$\frac{dP}{dt} = k_3 [A_2][C]$$

$$K_1 = \frac{[A_2]}{[A]^2} \quad [A_2] = K_1 [A]^2 \quad K_2 = \frac{[C]}{[A][B]} \quad [C] = K_2 [A][B]$$

$$\frac{dP}{dt} = k_3 K_1 [A]^2 K_2 [A][B] = k_3 K_1 K_2 [A]^3 [B]$$

....