SIGMA

1991 Cat II-3 V.2

$$O_3 + H \underset{k_1}{\overset{k_{-1}}{\rightleftharpoons}} O_2 + O + H$$

$$O_3 + O \xrightarrow{k_2} 2O_2 \quad \left| \frac{1}{2}\frac{d[O_2]}{dt} = k_2[O_3][O] \right.$$

$$\frac{d[O]}{dt} = k_1[O_3][H] - k_{-1}[O_2][O][H] - k_2[O_3][O] = 0 \quad \left| [O] = \frac{k_1[O_3][H]}{k_2[O_3] + k_{-1}[O_2][H]} \right.$$

$$\frac{1}{2}\frac{d[O_2]}{dt} = V = k_2[O_3]\,\frac{k_1[O_3][H]}{k_2[O_3] + k_{-1}[O_2][H]} = \boxed{\frac{k_1 k_2 [O_3]^2}{k_{-1}[O_2] + k_2[O_3][H]^{-1}} = V}$$

si $k_{-1}[O_2] \ll k_2\dfrac{[O_3]}{[H]}$ → $\boxed{V = k_1[O_3][H]}$

ó $[H] \ll k_2[O_3]$

si $[H] \gg k_2[O_3]$ → $\boxed{V = \dfrac{k_1 k_2 [O_3]^2}{k_{-1}[O_2]}}$