

$[A]_0 = 1,97 \cdot 10^{-5} \text{ M}, [B]_0 = 0,00 \text{ M}$

Equilibrium: $v_1 = v_2$ is pl: $\frac{d[A]}{dt} = 0$, $\frac{d[B]}{dt} = 0$

~~MA~~

$$\frac{d[B]}{dt} = k_1[A]^2 - k_2[B] = 0$$

$$k_1[A]^2 = k_2[B]$$

$$\frac{k_1}{k_2} = \frac{[B]}{[A]^2}$$

~~It is not possible to find the equilibrium concentration of A and B~~

Equilibrium

$$[A] = [A]_0 - x$$

$$[B] = \frac{x}{2}$$

Equilibrium: $k_1([A]_0 - x)^2 = k_2 \cdot \frac{x}{2}$

$$k_1(a_0^2 - 2a_0x + x^2) = k_2 \frac{x}{2}$$

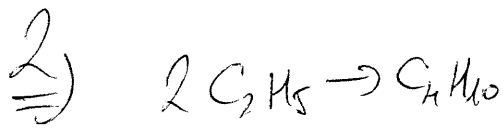
$$8,2275 \cdot 10^{-4} - 83,528x + 2,12 \cdot 10^6 x^2 = \frac{8,51 \cdot 10^4 x}{2}$$

$$2,12 \cdot 10^6 x^2 - 1,2633 \cdot 10^5 x + 8,2275 \cdot 10^{-4} = 0$$

Equilibrium: $[B] = 9,648 \cdot 10^{-9}$

$$x = 1,930 \cdot 10^{-8} \text{ M}$$

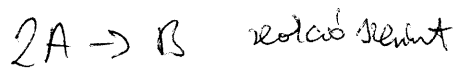
$$v = k_2[B] = 8,21 \cdot 10^{-4} \frac{\text{mol}}{\text{dm}^3 \text{ s}}$$



$t_1 = 0.02 s \rightarrow [C_2H_5] = 5.3166 \cdot 10^{-9} M$

$t_2 = 0.07 s \rightarrow [C_2H_5] = 1.728 \cdot 10^{-9} M$

$C(t) = ?$



$$\frac{d[A]}{dt} = -2[A]^2$$

$$\int \frac{1}{[A]^2} dA = -\int 2 dt$$

$$+\left(\frac{1}{[A]}\right)_{[A]_0}^t = +[2t]_0^t$$

$$\frac{1}{[A]} = \frac{1}{[A]_0} + 2t$$

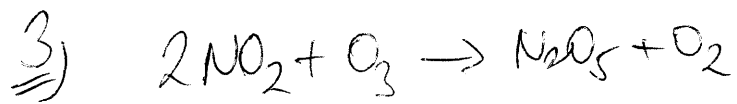
t_1 einsetzen: $\frac{1}{5.3166 \cdot 10^{-9}} = \frac{1}{[A]_0} + 0.02 \cdot 2 = 1.881 \cdot 10^8 = \frac{1}{[A]_0} + 0.02$

t_2 einsetzen: $\frac{1}{1.728 \cdot 10^{-9}} = \frac{1}{[A]_0} + 0.07 \cdot 2 = 5.787 \cdot 10^8 = \frac{1}{[A]_0} + 0.14$

$$3.906 \cdot 10^8 = 0.052$$

$$2 = 7.812 \cdot 10^9 \text{ dm}^3 \text{ mol}^{-1} s^{-1}$$

Die richtige initialkonzentration: $[A]_0 = 3.11393 \cdot 10^{-8} \frac{\text{mol}}{\text{dm}^3}$



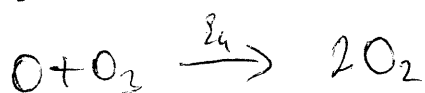
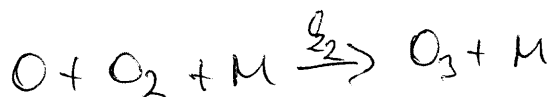
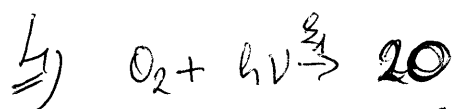
$$k = 2.0 \cdot 10^4 \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$$

Az előzőreket k mértékegységei ellet meg kell adni, miszerint

MÁSO DRENŐ, mert

$$\text{pl.: } \frac{da}{dt} = -k a^2$$

$$\frac{\text{mol}}{\text{dm}^3 \text{ s}} = X \cdot \frac{\text{mol}^2}{\text{dm}^6} \Rightarrow X = \frac{\text{dm}^3}{\text{mol} \cdot \text{s}}$$



$$a) \quad \frac{d[\text{O}_2]}{dt} = -k_1[\text{O}_2] - k_2[\text{O}][\text{O}_2][\text{M}] + k_3[\text{O}_3] + 2k_4[\text{O}][\text{O}_3]$$

$$\frac{d[\text{O}]}{dt} = 2k_1[\text{O}_2] - k_2[\text{O}][\text{O}_2][\text{M}] + k_3[\text{O}_3] - k_4[\text{O}][\text{O}_3]$$

$$\frac{d[\text{M}]}{dt} = 0$$

$$\frac{d[\text{O}_3]}{dt} = k_2[\text{O}][\text{O}_2][\text{M}] - k_3[\text{O}_3] - k_4[\text{O}][\text{O}_3]$$

b) QSSA: $\frac{d[\text{O}]}{dt} = 0 = 2k_1[\text{O}_2] - k_2[\text{O}][\text{O}_2][\text{M}] + k_3[\text{O}_3] - k_4[\text{O}][\text{O}_3]$

$$k_2[\text{O}][\text{O}_2][\text{M}] + k_4[\text{O}][\text{O}_3] = 2k_1[\text{O}_2] + k_3[\text{O}_3]$$

$$[\text{O}] \left(k_2[\text{O}_2][\text{M}] + k_4[\text{O}_3] \right) = 2k_1[\text{O}_2] + k_3[\text{O}_3]$$

$$\frac{[\text{O}]}{[\text{O}_3]} = \frac{\frac{2k_1[\text{O}_2]}{[\text{O}_3]} + k_3}{k_2[\text{O}_2][\text{M}] + k_4[\text{O}_3]}$$

Az $\frac{[\text{O}]}{[\text{O}_3]}$ hányados értéke nő a magassággal, mert

① k_1 és k_3 fotokémiai reakciók sebességi együtthatói, ezek értéke erősebb napsugárzás esetén nagyobb. Nagyobb magasságban erősebb a napsugárzás, mert vékonyabb légkör légrétegen haladt még csak át.

② nagyobb magasságban kisebb a nyomás
 $\rightarrow [\text{M}]$ kisebb