1.

Graphical user interface, text, application

Description automatically generated

2.

a) The rate of appearance of NO2:

d[NO2]/dt = ½ d[N2O5]/dt= ½ x 4,2.10^(-7) = 2,1.10^(-7) M/s

b) The rate of appearance of O2:

d[O2]/dt = 2d[N2O5]/dt = 8,4.10^(-7) M/s

3)

- Box 1: rate = k[A][B]^2 = k.5.5^2 = 125k

- Box 2: rate = k.7.3^2 = 63k

- Box 3: rate = k.3.7^2 = 147k

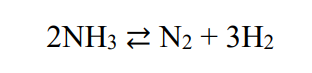
=> 2 < 1 < 3

4.

A picture containing diagram

Description automatically generated

5)



Initial 1 0 0

Change 2x x 3x

Equilibrium 1 – 2x x 3x

N2.T1/P1 = N2.T2/P2

* 273 = (1-2x+x+3x).819/3,3
* 273 = (1+2x).819/3,3
* x = 0.05

Kc = [N2].[H2]^2/[NH3]^3 = 2,08.10^-4

6.

Text, letter

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7)

- Because the rate law conforms to the molecularity of the first step which must be the rate-determining step. The second step must be faster than the first one.

- The experimental rate law rate = k[O3][NO2] suggests that the rate of the reaction depends on the concentrations of O3 and NO2. This implies that the first step of the mechanism, O3 (g) + NO2 (g) → NO3 (g) + O2 (g), is the rate-determining step. The second step, NO3 (g) + NO2 (g) → N2O5 (g), is faster and does not affect the overall rate of the reaction.

Text

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