

Kinetics Quiz A

1. The following rate data were collected for the reaction $2 \text{NO} + 2 \text{H}_2 \rightarrow \text{N}_2 + 2 \text{H}_2\text{O}$

Experiment	Initial [NO] (M)	Initial [H ₂] (M)	Rate (M/hr)
1	0.60	0.15	0.076
2	0.60	0.30	0.15
3	0.60	0.60	0.30
4	1.20	0.60	1.21
5	0.30	0.60	0.076

(a) Determine the exact rate equation for this reaction. Include the proper units for k .

$$R = \underline{\hspace{10em}}$$

(b) If the initial concentration of NO is 0.40 M and the initial concentration of H₂ is 0.50 M, what is the rate of reaction ?

$$R = \underline{\hspace{10em}} \text{ M/hr}$$

(c) By what factor will the rate change if the [NO] is tripled and the [H₂] is doubled ?

Kinetics Quiz B

1. The kinetic data listed in the table below were obtained for the following reaction:



experiment	[Y] (M)	[Z] (M)	Rate of Reaction (M/s)
1	0.20	0.20	0.0003
2	0.20	0.60	0.0009
3	0.60	0.20	0.0027
4	0.60	0.60	0.0081

(a) What is the exact rate equation for this reaction. Report the value of k with proper units.

$$R = \underline{\hspace{10em}}$$

(b) What is the rate of this reaction when the starting concentrations of each reactant is 0.30 M ?

$$R = \underline{\hspace{10em}} \text{ M/s}$$

(c) If the starting concentrations of *both* Y and Z are cut in half, how much slower will the new rate be ? Justify your answer.

2. Suggest three specific ways to decrease the rate of reaction.

(a)

(b)

(c)