

FINAL EXAM

U02(M,W,F)

Wednesday, December 7, 9:45am to 11:45am, PG5-155

U03(T,R)

Thursday, December 8, 7:15pm to 9:15pm, PG6-116

For problems involving calculations you must show your work for credit. Unless otherwise stated, you may assume $T = 25.0\text{ }^{\circ}\text{C}$.

1) The value for A in the Arrhenius equation depends on which of the following?

- a) collision frequency
- b) orientation of the reactant molecules
- c) activation energy
- d) Both a and b
- e) Both a and b and c

2) The reaction



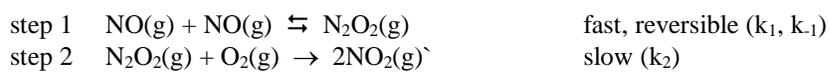
plays a role in the chemistry of ozone in the stratosphere. Experimentally, the following results are found for the rate constant for reaction 2.1

$T = 300.0\text{ K}$	$k = 7.4 \times 10^{-14}\text{ cm}^3/\text{molecule}\cdot\text{s}$
$T = 250.0\text{ K}$	$k = 4.0 \times 10^{-14}\text{ cm}^3/\text{molecule}\cdot\text{s}$

Based on this information, find the value for E_a and A for the above reaction (including correct units).

3) Define the following: catalyst

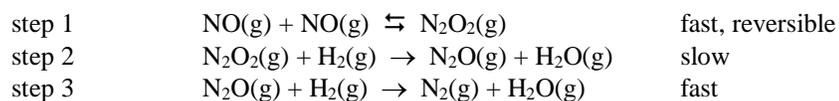
4) For the mechanism given below for the formation of NO_2 , predict the corresponding rate law.



5) Nitrogen monoxide (NO) reacts with hydrogen (H_2) by the following process



One possible mechanism for this reaction is the following:



a) List all of the reaction intermediates in the above mechanism. _____

b) Give the rate law predicted for the above mechanism. Give the individual reaction orders and the overall order of reaction for the rate law you have obtained.