## HW08 - Kinetics

Question 1	0.5 pts
Consider the reaction: $2O_3(g) \longrightarrow 3O_2(g) \qquad \text{rate = } k[O_3]^2[O_2]^{-1}$ What is the overall order of the reaction and the order with respect to $[O_3]$ ?	
O 2 and 2	
○ -1 and 3	
○ 3 and 2	
○ 1 and 2	

Question 2	0.5 pts
When the reaction below:	
$3NO(g) \longrightarrow N_2O(g) + NO_2(g)$	
is proceeding under conditions such that 0.015 mol/L of $N_2O$ is being formed easecond, the rate of the overall reaction is and the rate of change for l	
0.015 M/s; -0.005 M/s	
0.030 M/s; -0.005 M/s	
0.015 M/s; -0.045 M/s	
0.015 M/s; 0.045 M/s	

Question 3	1 pts		
What is the rate law for the reaction below:  A + B + C → D  if the following data were collected?			
Exp [A] <sub>0</sub> [B] <sub>0</sub> [C] <sub>0</sub> Initial Rate 1 0.4 1.2 0.7 2.32x10 <sup>-3</sup> 2 1.3 1.2 0.9 7.54x10 <sup>-3</sup> 3 0.4 4.1 0.8 9.25x10 <sup>-2</sup> 4 1.3 1.2 0.2 7.54x10 <sup>-3</sup>			
orate = 3.36x10 <sup>-3</sup> [A] [B] <sup>3</sup>			
rate = 1.49x10 <sup>-3</sup> [B] <sup>3</sup> [C]			
rate = 5.37x10 <sup>-3</sup> [A] [B] <sup>3</sup>			
orate = 1.79x10 <sup>-3</sup> [B] <sup>2</sup> [C]			
○ rate = 4.48x10 <sup>-3</sup> [A] [B] <sup>2</sup> [C]			

Que	stio	n 4		1 pt
A che	emica	ıl rea	ction is expressed b	y the balanced chemical equation:
A + 2	В —	→ C		
Cons	ider t	he da	ata below:	
ехр	[A] <sub>0</sub>	[B] <sub>0</sub>	initial rate (M/min)	
1	0.15	0.15	0.00110363	
2	0.15	0.3	0.0044145	
3	0.3	0.3	0.008829	
	the ra		w for the reaction.	
	ite = k		[B]	
O ra	ate = k	(A) [E	3] <sup>2</sup>	
O ra	ate = k	(A) [E	3]	

Question 5	0.5 pts
Calculate the value of the rate constant (k) for the reaction in question 4.	
O 0.00736	
O.00110	
0.000166	
O 0.327	

Question 6	0.5 pts
If the initial concentrations of both A and B are 0.31 M for the reaction in que 5, at what initial rate is C formed?	estions 4 and
0.00974 M/min	
O -0.00974 M/min	
O 0.0314 M/min	
O.101 M/min	

at a certain temperature is rate = [NO] <sup>2</sup> [O <sub>2</sub> ]. We carry out two experiments involving this reaction at the same temperature, but in the second experiment the initial concentration of NO is doubled while the initial concentration of O <sub>2</sub> is halved. The initial rate in the second experiment will be how many times that of the first?    Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that of the first?   Not enough the second experiment will be how many times that one in the second experiment will be how many times that one the second experiment will be how many times that of the first?   Not enough the second experiment will be how as a second experiment will be how as a second experiment will be second experiment will be how the second experiment will be how as a second experiment will be second experiment will be a second experiment will be second experiment will b	Question 7	1 pts	Question 1
at a certain temperature is rate = [NO] <sup>2</sup> [O <sub>2</sub> ]. We carry out two experiments involving this reaction at the same temperature, but in the second experiment the initial concentration of NO is doubled while the initial concentration of O <sub>2</sub> is halved. The initial rate in the second experiment will be how many times that of the first?    Question 8	We know that the rate expression for the reaction below:		Consider the r
Picco   Consider the data collected for a chemical reaction between compounds A and B that is	$2NO + O_2 \longrightarrow 2NO_2$		H <sub>2</sub> CO <sub>3</sub> (aq) —
Second experiment will be how many times that of the first?    0   2   3   2   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   4   5   6   6   6   4   5   6   6   6   6   6   6   6   6   6	reaction at the same temperature, but in the second experiment the initial c	oncentration	If it has a half- [H <sub>2</sub> CO <sub>3</sub> ] of 12
Question 8  1 pts  Consider the data collected for a chemical reaction between compounds A and B that is first order in A and first order in B:    Dot    A      B     rate (M/s)     1                         2			O Not enough
Question 8  1 pts  Consider the data collected for a chemical reaction between compounds A and B that is first order in A and first order in B:    One   (A _0)   (B _0)   rate (M/s)     1   0.2   0.05   0.1     2   7   0.05   0.4     3   0.4   7   0.8      One   0.40 M; 0.10 M     One   0.40 M; 0.20 M; 0.20 M     One	○ 2		○ 3.2 sec
Question 8  1 pts  Consider the data collected for a chemical reaction between compounds A and B that is first order in B:    One of the data collected for a chemical reaction between compounds A and B that is first order in B:   One of the data collected for a chemical reaction between compounds A and B that is first order in B:   One of the collected for a chemical reaction between compounds A and B that is found to b.   B. The reactiple of the collected placed in a 1 A has fallent at A has f	○ 8		○ 6.4 sec
Question 8  1 pts  Consider the data collected for a chemical reaction between compounds A and B that is first order in A and first order in B:    No.   (A)   (B)   (a)   (B)   (a)   (a)   (b)   (a)   (a	O 4		2.9 sec
At a certain f  Consider the data collected for a chemical reaction between compounds A and B that is first order in A and first order in B:    National	O 1		
At a certain f A(g) + 2B(g) is found to b B. The reaction B:    Name   [A]_0   [B]_0   rate (M/s)   1   0.2   0.05   0.1   2   7   0.05   0.4   3   0.4   7   0.8   Name   0.40 M; 0.10 M   0.20 M; 0.80 M   0.20 M; 0.80 M   0.80 M; 0.20 M   0.40			Question 1
Consider the data collected for a chemical reaction between compounds A and B that is first order in A and first order in B:    Mail   Dig   Tate (M/s)	Question 8	1 pts	At a certain fix
3 0.4 ? 0.8  From the information above for 3 experiments, determine the missing concentrations of A and B. Answers should be in the order [A] then [B].  ○ 0.40 M; 0.10 M  ○ 0.80 M; 0.20 M  ○ 0.40 M; 0.20 M   Question  Question  The reaction A → product is observed the line?  Question  Question  In[A] vs t  ○ [A] vs t	first order in A and first order in B:    TXN   [A]_0   [B]_0   rate (M/s)     1   0.2   0.05   0.1	and B that is	A(g) + 2B(g) - is found to be B. The reactio placed in a 1.0 A has fallen to
From the information above for 3 experiments, determine the missing concentrations of A and B. Answers should be in the order [A] then [B].  O .40 M; 0.10 M  O .20 M; 0.80 M  O .80 M; 0.20 M  O .40 M; 0.20 M  O .40 M; 0.20 M  Question  The reaction A —> production is observed fine?  O .5 pts  In[A] vs t			○ 10.22 sec
and B. Answers should be in the order [A] then [B].  0.40 M; 0.10 M  0.80 M; 0.10 M  0.80 M; 0.20 M  0.40 M; 0.20 M  0.5 pts  Cuestion  1 In[A] vs t			37.94 sec
O .40 M; 0.10 M  O .20 M; 0.80 M  O .80 M; 0.20 M  O .40 M; 0.20 M  The reaction A → production of the reaction that is zero-order overall  In the rate does not change during the reaction.  The reaction that is zero-order overall  In the rate constant is zero.  The reaction that is zero-order overall  In [A] vs t	-	entrations of A	O There is no
O .20 M; 0.80 M O .80 M; 0.10 M  O .80 M; 0.20 M  The reaction A → produtis observed to line?  Question 9  O.5 pts  In[A] vs t			2.83 sec
O .80 M; 0.10 M  O .80 M; 0.20 M  The reaction A → production 9  O.5 pts  For a reaction that is zero-order overall  the rate does not change during the reaction.  the reactant concentration does not change with time.  the rate constant is zero.  the activation energy is zero.	0.40 M; 0.10 M		
O .80 M; 0.20 M  O .40 M; 0.20 M  The reaction A → production is observed filine?  Question 9  O .5 pts  In[A] vs t			Question 1
The reaction A → production 9  O.5 pts  or a reaction that is zero-order overall  or the rate does not change during the reaction.  or the reactant concentration does not change with time.  or the rate constant is zero.  or the activation energy is zero.			Quodion 1
is observed tine?  ☐ In[A] vs t ☐ In[A] vs			The reaction b
line?    Comparison of the property of the rate does not change with time.   In[A] vs t	0.40 M; 0.20 M		A → produc
In[A] vs t			is observed to line?
For a reaction that is zero-order overall  the rate does not change during the reaction.  the reactant concentration does not change with time.  the rate constant is zero.  the activation energy is zero.  In[A] vs k	Question 9	0.5 pts	○ In[A] vs t
the rate does not change during the reaction.  [A] vs t <sup>-1</sup> the reactant concentration does not change with time.  the rate constant is zero.  [A] vs t <sup>-1</sup> In[A] vs t <sup>-1</sup> [A] vs k <sup>-1</sup> In[A] vs k <sup>-1</sup>	For a reaction that is zero-order overall		
the reactant concentration does not change with time.  the rate constant is zero.  In[A] vs t <sup>-1</sup> In[A] vs k <sup>-1</sup> In[A] vs k <sup>-1</sup>	the rate does not shoom during the regation		○ [A] vs t
the rate constant is zero.  In[A] vs t <sup>-1</sup> [A] vs k <sup>-1</sup> In[A] vs k <sup>-1</sup>			○ [A] vs t <sup>-1</sup>
the activation energy is zero.  [A] vs k  In[A] vs k	<u> </u>		O In[A] vs t <sup>-1</sup>
○ In[A] vs k*			○ [A] vs k
Question 10 0.5 pts	The activation chergy is 2010.		○ In[A] vs k <sup>-1</sup>
	Question 10	0.5 pts	
	$A + B \longrightarrow C$		
	If it is 1st order in A and 0th order in B, a plot of In[A] vs time will have a slo	pe that is	
	slowly increasing.		
If it is 1st order in A and 0th order in B, a plot of In[A] vs time will have a slope that is	decreasing exponentially.		
If it is 1st order in A and 0th order in B, a plot of In[A] vs time will have a slope that is	oconstant.		
fit is 1st order in A and 0th order in B, a plot of In[A] vs time will have a slope that is  slowly increasing.  decreasing exponentially.	increasing exponentially.		

Question 11	1 p
Consider the reaction below:	
$H_2CO_3(aq) \longrightarrow CO_2(aq) + H_2O(l)$	
If it has a half-life of 1.6 sec, how long will it take a sys $[H_2CO_3]$ of 125mM?	tem with [H <sub>2</sub> CO <sub>3</sub> ] <sub>0</sub> of 2M to reach
Not enough information is given.	
○ 3.2 sec	
○ 6.4 sec	
○ 2.9 sec	
Question 12	1 pi
is found to be first order in the concentration of A and	zeroth order in the concentration o
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles oplaced in a 1.00 liter container, how many seconds will	of A and 4.00 moles of B are
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles oplaced in a 1.00 liter container, how many seconds will	of A and 4.00 moles of B are
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?	of A and 4.00 moles of B are
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec	of A and 4.00 moles of B are
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec  37.94 sec	of A and 4.00 moles of B are
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec  37.94 sec  There is not enough information to answer.  2.83 sec	of A and 4.00 moles of B are elapse before the concentration of
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec  37.94 sec  There is not enough information to answer.  2.83 sec	of A and 4.00 moles of B are elapse before the concentration of
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec 37.94 sec There is not enough information to answer.  2.83 sec  Question 13	of A and 4.00 moles of B are elapse before the concentration of
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec  37.94 sec  There is not enough information to answer.  2.83 sec  Question 13  The reaction below:	of A and 4.00 moles of B are elapse before the concentration of
37.94 sec      There is not enough information to answer.	of A and 4.00 moles of B are elapse before the concentration of the conc
B. The reaction rate constant is 0.05s <sup>-1</sup> . If 2.00 moles of placed in a 1.00 liter container, how many seconds will A has fallen to 0.30 moles/liter?  10.22 sec 37.94 sec There is not enough information to answer. 2.83 sec  Question 13  The reaction below: A → products is observed to obey first-order kinetics. Which of the formation in the second products is observed to obey first-order kinetics. Which of the formation is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the second place in the second place is 1.00 months in the seco	of A and 4.00 moles of B are elapse before the concentration of the conc

Question 14	1 pts
For the reaction below:	
$cyclobutane(g) \longrightarrow 2ethylene(g)$	
at 800K, a plot of In[cyclobutane] vs t gives a straight line with a Calculate the time needed for the concentration of cyclobutane value.	
○ 0.63 sec	
○ 1.3 sec	
○ 1.7 sec	
○ 1.6 sec	
Question 15	1 pts
The initial concentration of the reactant A in a first-order reaction the concentration has fallen to 0.3 M. What is the rate constant	
○ 0.02 s <sup>-1</sup>	
0.2 s <sup>-1</sup>	
0.01 s <sup>-1</sup>	
onot enough information	
Question 16	1 pts
A reaction is found to be first order with respect to one of the reamight a plot of In[A] vs time NOT yield a straight line?	actant species, A. When
if the reaction comes to equilibrium	
if the reaction has any significant backward rate	
when the rate also depends on the concentration of another reactant	t as well
All of the other answers could be correct.	
Question 17	0.5 pts
Consider the following elementary reactions:	
a) NO + O <sub>3</sub> $\longrightarrow$ NO <sub>2</sub> + O <sub>2</sub> b) CS <sub>2</sub> $\longrightarrow$ CS + S	
c) $O + O_2 + N_2 \longrightarrow O_3 + N_2$	
Identify the molecularity of each reaction respectively.	
bimolecular, unimolecular, termolecular	
o bimolecular, unimolecular, termolecular  all three elementary reactions are bimolecular	
tetramolecular, termolecular, pentamolecular	
it is impossible to know without knowing the overall reaction for each	1

Question 18 1 pts

A and B react to form C according to the single step reaction below:

 $A+2B\longrightarrow C$ 

Which of the following is the correct rate equation for [B] and the correct units for the rate constant of this reaction?

- $\bigcirc \frac{\Delta[B]}{\Delta t} = -\frac{2k[A][B]}{[C]}; \frac{1}{M \cdot s}$
- $\bigcirc \,\, rac{\Delta \left[ B 
  ight]}{\Delta t} \, = \, -2k \left[ A 
  ight] \left[ B 
  ight] ; \,\,\,\, rac{1}{M \cdot s}$
- $\bigcirc \frac{\Delta[B]}{\Delta t} = -2k[A][B]^2; \frac{1}{M^2 \cdot s}$
- $\bigcirc \frac{\Delta[B]}{\Delta t} = -k[A][B]^2; \frac{1}{M^2}$

Question 19		1 pts
Consider the mechanism be	low:	
Consider the mechanism be	IOW.	
$NO_2 + F_2 \longrightarrow NO_2F + F$	k <sub>1</sub> , slow	
$F + NO_2 \longrightarrow NO_2F$	k <sub>2</sub> , fast	
What is the rate law?		
rate = k <sub>1</sub> [NO <sub>2</sub> ][F <sub>2</sub> ]		
rate = k <sub>2</sub> [NO <sub>2</sub> ][F]		
orate = k <sub>1</sub> [NO <sub>2</sub> F][F <sub>2</sub> ]		
$\bigcirc \text{ rate = } k_1 k_2 [NO_2]^2$		
$\bigcap \text{ rate = } k_2[NO_2]^2$		

Question 20	1 pts
Determine the overall balanced equation for a reaction having the following propos mechanism:	sed
Step 1: $B_2 + B_2 \longrightarrow E_3 + D$ slow	
Step 2: $E_3 + A \longrightarrow B_2 + C_2$ fast	
and write an acceptable rate law.	
$\bigcirc$ A + B <sub>2</sub> $\longrightarrow$ C <sub>2</sub> + D; rate = k[B <sub>2</sub> ] <sup>2</sup>	
$\bigcirc A + B_2 \longrightarrow C_2 + D; rate = k[A][B_2]$	
$\bigcirc$ 2B <sub>2</sub> $\longrightarrow$ E <sub>3</sub> + D; rate = k[B <sub>2</sub> ] <sup>2</sup>	
$\bigcirc$ E <sub>3</sub> + A $\longrightarrow$ B <sub>2</sub> + C <sub>2</sub> ; rate = k[E <sub>3</sub> ][A]	

Question 21	1 pts	Question 25
Consider the reaction below:		A certain reaction has an activation energy of 0.8314 kJ/mol and
$H_2(g) + I_2(g) \longrightarrow 2HI(g)$		s <sup>-1</sup> at -73°C. At -173°C, which expression for the rate constant is
The proposed mechanism of this reaction is:		$\bigcirc \ln(k_{\star}) = 0.5$
$l_2 \rightleftharpoons 2l$ $k_1$ , $k_1$ (reverse rxn), fast		
$2I + H_2 \longrightarrow 2HI$ $k_2$ , slow		ln(k <sub>2</sub> ) = -0.5
What is the rate of the overall reaction?		O In(k <sub>2</sub> ) = 1
$\bigcirc \ rate = k_1k_2[I_2][H_2]$		○ ln(k₂) = 1.5
$\bigcirc \ rate \ = \ \frac{h_1 h_2}{h_{-1}} [I]^2 \ [H_2]$		
		Question 26
$\bigcirc \ rate = rac{k_1 k_2}{k_1} [I_2] [H_2]$		A food substance kept at 0°C becomes rotten (as determined by in 8.3 days. The same food rots in 10.6 hours at 30°C. Assuming
$\bigcirc \ rate \ = \ \tfrac{k_1k_2}{k_{-1}}[I_2] \ [H_2]$		microorganisms enzymatic action is responsible for the rate of de activation energy for the decomposition process? Hint: Rate varie
		time; a faster rate produces a shorter decomposition time.
Question 22	1 pts	○ 67.2 kJ/mol
A reaction rate increases by a factor of 655 in the presence of a catalyst at 37°C.		2.34 kJ/mol
activation energy of the original pathway is 106 kJ/mol. What is the activation energible new pathway, all other factors being equal?	gy of	○ 0.45 kJ/mol
16,600 J/mol		
○ 89.3 kJ/mol		Question 27
99.3 J/mol		
○ 16,600 kJ/mol		A catalyst
		speeds up the reaction but does not change K.
Ourastian 22	4 4	increases K to favor product formation.
Question 23	1 pts	O changes the reaction mechanism to ensure that K is increased.
A given reaction has an activation energy of 24.52 kJ/mol. At 25°C, the half-life is 4 minutes. At what temperature will the half-life be reduced to 20 seconds?	4	o speeds up the reaction and increases K to favor product formation.
○ 100°C		
0 125°C		Question 28
		All also being a good a good to a life to be a life to a set of
○ 115°C ○ 150°C		All else being equal, a reaction with a higher activation energy colower activation energy will
		proceed faster.
		be more endothermic.
Question 24	1 pts	proceed slower.
For the reaction below:		o be more exothermic.
$HO(g) + H_2(g) \longrightarrow H_2O(g) + H(g)$		
a plot of lnK vs 1/T gives a straight line with a slope equal to -5.1x10 <sup>3</sup> K. What is th activation energy for this reaction?	ne	
○ 12 kJ/mol		
42 kJ/mol		
○ 5.1 kJ/mol		
98 kJ/mol		

Question 25	1 pt
A certain reaction has an activation energy of 0.8314 kJ/mol a s <sup>-1</sup> at -73°C. At -173°C, which expression for the rate constan	
○ In(k₂) = 0.5	
○ In(k₂) = -0.5	
○ In(k <sub>2</sub> ) = 1	
○ ln(k₂) = 1.5	
Question 26	1 pt
	. 10-
in 8.3 days. The same food rots in 10.6 hours at 30°C. Assum microorganisms enzymatic action is responsible for the rate o activation energy for the decomposition process? Hint: Rate v	by a good quantitative test ning the kinetics of the of decay, what is the
A food substance kept at 0°C becomes rotten (as determined in 8.3 days. The same food rots in 10.6 hours at 30°C. Assumicroorganisms enzymatic action is responsible for the rate o activation energy for the decomposition process? Hint: Rate vitime; a faster rate produces a shorter decomposition time.	by a good quantitative test ning the kinetics of the of decay, what is the
in 8.3 days. The same food rots in 10.6 hours at 30°C. Assummicroorganisms enzymatic action is responsible for the rate of activation energy for the decomposition process? Hint: Rate vitime; a faster rate produces a shorter decomposition time.	by a good quantitative test ning the kinetics of the of decay, what is the
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in 8.3 days. The same food rots in 10.6 hours at 30°C. Assummicroorganisms enzymatic action is responsible for the rate of activation energy for the decomposition process? Hint: Rate witime; a faster rate produces a shorter decomposition time.  23.4 kJ/mol  67.2 kJ/mol	by a good quantitative test ning the kinetics of the of decay, what is the

Question 28	1 pts
All else being equal, a reaction with a higher activation energy compared to one w lower activation energy will	ith a
proceed faster.	
o be more endothermic.	
oproceed slower.	
o be more exothermic.	

Question 29	1 pts
Consider the potential energy diagram below:  700  A  avg. energy of reactants  B  avg. energy of products	
Reaction coordinate	
What is the change in enthalpy ( $\Delta H$ ) for the reaction A $\longrightarrow$ B?	
○ -100 kJ	
○ 350 kJ	
○ 100 kJ	
○ -350 kJ	

Question 30	1 pts
Consider the potential energy diagram in question 39. What is the activation ener for the reaction?	gy (E <sub>a</sub> )
○ 350 kJ	
○ 100 kJ	
○ 200 kJ	
○ 250 kJ	

Question 31	1 pts
Which of the following statements is TRUE?	
<ul> <li>If the exponents in the rate-law do not match the coefficients in the balanced chemical of then we know that the reaction takes place in one step.</li> </ul>	equation,
<ul> <li>The exponents in the rate-law must match the coefficients in the balanced chemical equipment the reaction.</li> </ul>	uation for
If the exponents in the rate-law do not match the coefficients in the balanced equation, know that the reaction does not take place in one step.	then we
The rate-law for a reaction can be predicted from the balanced chemical equation.	

Question 32	1 pts
"Reaction mechanisms usually involve only unimolecular or bimolecular steps."	
Is this statement true or false?	
<ul> <li>True, because collisions of higher molecularity would occur too infrequently to account fo observed rate.</li> </ul>	r an
True, because steps of higher molecularity would not be compatible with observed reaction laws.	on rate
○ False.	
True, because the activation energy for collisions of higher molecularity would be too greater.	at.

Question 33	1 pts
Which of the following is/are ALWAYS true concerning collision and transition statheory?	ate
) Transition states are short-lived.	
II) A balanced reaction shows which species must collide for the reaction to occu	ır.
III) Intermediates are short-lived.	
O. L	
O I and III	
All are true.	
All are true.	
All are true.      Il and III	

Question 34	1 pts
Consider the following reaction mechanism:	
1) $Cl_2 + Pt \longrightarrow 2Cl + Pt$	
2) CI + CO + Pt $\longrightarrow$ CICO + Pt	
3) CI + CICO $\longrightarrow$ CI <sub>2</sub> CO	
Overall: $Cl_2 + CO \longrightarrow Cl_2CO$	
Which species is/are intermediates?	
O Pt, CI, CICO	
Pt, CI, CICO	
O Pt	